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OF

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EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

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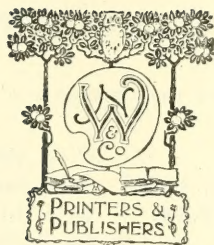
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ABERRATIONS OF *ACIDALIA MARGINEPUNCTATA* AND *A. SUBSERICEATA*.

BY LOUIS B. PROUT, F.E.S.



A. marginepunctata.—1, typical; 2, aberration. *A. subsericeata*.—3, typical; 4, aberration.

THE very interesting aberrations here figured were both captured in North Cornwall, by Mr. G. B. Oliver, of Tettenhall, Wolverhampton, during the past summer, and have been exhibited at the meetings of some of our London societies. The specimen of *A. marginepunctata*, a female taken on July 2nd, deposited a very few eggs, and from these three moths were bred at the beginning of September, appreciably darker than the typical form, but not really striking; five larvæ persisted in hibernating. The *A. subsericeata* was taken on June 26th, and seems an absolutely unique aberration of this species, which, though somewhat variable, is usually so only within very narrow limits.

A. marginepunctata is well known to be an extremely variable species, and dark local races are by no means unknown; but a practically black specimen like the one figured, which is darker than the photograph represents it, would be an extreme rarity

everywhere. Its occurrence in North Cornwall, where the normal form (as here also figured), does not seem to be at all exceptionally dark, is all the more striking. The only aberration indicated in Staudinger's 'Catalog' is a *whiter* form (ab. *pastoraria*, Joan.).

It will be observed that the fringes in both cases are paler in colour than in the typical form.

CURRENT CRITICISM.

By W. L. DISTANT.

MR. KIRKALDY is to be praised for the industry with which he pursues his task as reviewer of current entomology, but accuracy is always an advantage, and his last notes in the 'Entomologist' (1906, p. 283), so far as they apply to myself, require reply. In referring to my 'Catalogue of the Cicadidæ,' he writes:—"On p. 146, *Cicada angulata*, Hagen, is cited as a synonym of *Tibicen annulatus*; on p. 168 it is given by Distant as a synonym of *Cicadetta hageni*." This statement is almost a *suppressio veri*! On p. 166 (not 146) I give the synonymy as stated, but on p. 168 I am only referring to a species of which I have no personal knowledge, among others of a similar description, separated by a dividing line, and only quoted as probably belonging to the genus *Melampsalta* (not *Cicadetta*); thus *M.?* *hageni*. Fieber gives as its synonym part of Hagen's species—" *Cicada annulata*, Hag. (nec Brullé,)" and I therefore could not refer to the one without the other.

Mr. Kirkaldy's emphatic assertion that "Amyot's mononymics, accepted by Distant, have no place in trinomial nomenclature," is negatived by their employment by Stål, Karsch, and other qualified writers. His further remark, "as is often the case with this author, accuracy of dates seems a minor matter," seems to be an expression of Mr. Kirkaldy's opinion, and therefore concerns nobody but himself.

Mr. Kirkaldy has also referred to a difference of opinion between Dr. Reuter and myself regarding the classification of the Capsidæ, which he says, with perfect accuracy, "the learned Finlander resents." He also gives his decision that my groups are "entirely artificial," and that Dr. Reuter's "are based, as far as present knowledge permits, on philosophical principles." It therefore seems a little surprising that Mr. Kirkaldy should have recently (Trans. Amer. Ent. Soc. 1906) proposed his own classification of the family, rather than follow that of "the learned Finlander," and in which he has proposed a division of some twenty-six tribes. It is only fair, however, to Mr. Kirkaldy to say that, in a subsequent publication of the same year

('Canadian Entomologist'), he has made some fifty-six corrections (or, as he describes them, "additions and emendations") to his paper, and therefore it is an immature publication, and one to which probably he does not desire a too serious notice, particularly as I observe, among some other matters not yet corrected, he has on p. 134 placed the genus *Angerianus*, Dist., in his tribe Cyclapiini, while on p. 146 he enumerates the same genus under "Genera not described so as to admit of approximate location."

I take this opportunity to correct myself. In the homopterous subfamily Cixiinae I proposed (1906) the genus *Barma* for an eastern species, and in which I said the *Cixius finitus*, Walk., should also be included. *Barma*, however, must be suppressed in favour of *Borysthenes*, Stål (1866), which was described by Stål in his 'Hemiptera Africana,' without type or locality being given. But I overlooked the fact that in a subsequent and other publication he gave the *C. finitus*, Walk., as type of his genus, and that, therefore, settles the question.

ON SOME HYMENOPTERA COLLECTED BY MR. G. C. DUDGEON AT BUXA, BHOTAN.

By P. CAMERON.

I AM indebted to Col. C. T. Bingham for the species described in this paper.

TENTHREDINIDÆ.

Allantus dudgeoni, sp. nov.

Black; the clypeus, a spot on the apex of the pronotum, broad at the base and incised in the middle there, gradually narrowed towards the apex, and broad bands on all the abdominal segments—the bands on the second and third narrowed in the middle—ivory white; the apical bands darker cream-coloured (perhaps through discoloration); the coxæ below and at the apex above, the four front femora and tibiæ below, the anterior tarsi, except the apices of the joints, and the middle tarsi for the greater part below, yellowish white. Wings hyaline, highly iridescent; the radial, fore half of cubitals, and the median cellules fuscous violaceous; the apex of costa and stigma dark testaceous, the nervures black; the base of transverse radial nervure running almost parallel with the costa, the apex sloped obliquely like the fourth transverse cubital nervure. ♀.

The male similar, but with the labrum white like the clypeus, and the mark on the apex of pronotum is smaller and triangular, not incised at the apex.

Length, 13 mm., ♀; ♂, 10 mm.

Front in the centre behind the ocelli raised, clearly separated by curved furrows, and bearing a few large scattered punctures; outside the furrows is a smooth space, the rest stoutly, deeply, but not very closely punctured. The front is depressed laterally, and deeply irregularly punctured; there is no frontal area; the lower part is raised, and is closely, distinctly, but not coarsely punctured. Clypeus and labrum sparsely punctured; the apex of the former roundly incised. The third joint of the antennæ is nearly double the length of the fourth. Mesonotum strongly, deeply punctured, except at the apex, where the puncturation is much finer and closer; in the centre the punctures are larger, and interlace. Scutellum sparsely punctured, weakly at the base, stronger towards the apex. Pleuræ strongly, closely punctured; the base of the propleuræ smooth; the metapleuræ finely and closely punctured. Abdomen smooth. Temples rounded, but not narrowed; the occiput margined, not quite transverse. The head in the female is slightly narrower than the thorax; in the male it is almost as wide as it. Except the last, the ventral segments are all broadly banded with yellow. At the bottom, below the hind wings, is a large horn-shaped pale yellow mark.

This species has been taken at Sikkim by Col. Bingham.

BRACONIDÆ.

Iphiaulax bhotanensis, sp. nov.

Ferruginous; smooth and shining, sparsely covered with fuscous hair, which is longer on the metanotum and base of abdomen; the flagellum of antennæ black, fuscous at the base; wings yellowish hyaline, the stigma and nervures luteous; there is a broad blackish cloud, extending obliquely from the costa at the base of stigma to the recurrent nervure, it occupying the discoidal cellule, except a triangular space at base; there is a light fuscous cloud at the apex of both wings, that on the anterior reaching to the second transverse cubital nervure, and more broadly backwards behind. ♀. Length, 14 mm.; terebra, 10 mm.

Abdomen slightly longer than the head and thorax united, not dilated in the middle, as wide as the thorax. There is a distinct longitudinal keel in the centre of the first abdominal segment on the basal three-fourths, the keel stoutest in the middle; there is a similar keel, triangularly dilated at the base—the triangle longer than it is wide at the base—down the middle of second segment, extending close to the apex; the suturiform articulation is wide and crenulated; there is a wide, deep, curved depression down the sides of the second segment, and a narrower, oblique, clearly defined one on the basal lateral half of the third; there is a smooth, distinct, transverse furrow on the base of the fourth. Face distinctly but not closely punctured. Temples wide, obliquely narrowed, not or hardly rounded; the occiput not quite transverse. Ocellar region distinctly raised. Wings longer than the body; the recurrent nervure is received in the apex of the first cubital cellule, not interstitial; the transverse median nervure is not quite interstitial, being received shortly beyond the transverse basal.

ICHNEUMONIDÆ.

Hadrocryptus tuberculatus, sp. nov.

Black; the face, clypeus, except for a small irregular mark in the centre of the top above, extending on to the face, and a narrow line on its apex, dilated in the middle, and extending on to the margined sides, labrum, mandibles except the teeth, palpi, the inner orbits to the occiput, the outer more broadly from near the top, where it is narrowed, below extending on to the malar space; pronotum at the base, a line, narrowed behind, on the sides of the middle lobe of mesonotum at the base, a transverse mark near the apex of the middle lobe, scutellum, except for a mark on the base, post-scutellum, scutellar keels, a large mark on the apical slope of the metanotum, its apex obliquely dilated laterally, the sides of the dilated part oblique, straight; the top rounded; a large mark on the lower part of mesopleuræ, its basal half narrowed and turned upwards, a narrow line on the apex reaching to near the bottom from the top, a broad line on the upper three-fourths of the apex of the metapleuræ, bands on the apices of the abdominal segments, broad on the basal segments, becoming narrower on the apical, especially in the centre; that on the penultimate wider and more irregular, and the basal and apical ventral segments broadly, pale yellow. Four front legs yellow, the femora fulvous, the apical joints of the tarsi black; the hind coxæ black, a large yellow mark on the top above, obliquely widened on the inner side, the basal joint of the trochanters yellow, streaked with black above, the apical black; the femora fulvous, the base very slightly, the apical sixth black; the tibiæ and tarsi yellow, the base of the former narrowly, its apex more broadly black, as is also the extreme apex of the last joint of the hind tarsi. The sixth to the eleventh joints of the antennæ are white, except above. Wings hyaline, the nervures and stigma black. ♀. Length, 15 mm.; terebra, 5 mm.

Face and clypeus distinctly punctured, the latter more closely and strongly than the former; its apex transverse, tuberculate in the middle, the sides distinctly curled up; the tubercle on the face large, longer than wide, narrowed below. Front and vertex smooth, the latter slightly punctured in the middle, the former much more distinctly and closely punctured in the middle, where there is an indistinct crenulated furrow. Mesonotum closely but not strongly punctured; the scutellum much more coarsely punctured, the post-scutellum smooth. Base of metanotum smooth, the part between the base and keel closely but not strongly punctured; the apical part closely reticulated; the basal keel complete; the apex with a broader keel on the sides. Propleuræ smooth, the middle and lower apical part closely striated; the mesopleuræ, except at the apex above, closely finely punctured; the depression at the base with some stout keels, as has also the bordering apical furrow. The metapleuræ at the spiracles finely punctured; the lower basal part coarsely punctured, the apical stoutly, obliquely striated, the striæ more or less intermixing. First abdominal segment smooth at the base, the dilated part closely but not strongly punctured; in its centre is a large ovate fovea; the second is closely, distinctly punctured, the third weakly punctured, the others smooth.

The systematic position of *Hadrocryptus* is not clear. It has the parapsidal furrows, the sternal furrow, and the spiracles on the first abdominal segment as in the Cryptinæ, and the oral region is as in that group; on the other hand, the fore legs are as in the Xoridini, the tibiæ being short, thick, and distinctly contracted or narrowed at the base. The claws are large and curved, the tibiæ spinose; the four hind tibiæ are curved at the base. The transverse median nervure in the hind wings is broken below the middle; in the fore wings it is received before the transverse basal. The temples are not very broad, and are roundly narrowed. Its resemblance to *Echthrus* (which has been placed by some authors in the Cryptinæ, by others in the Pimplinæ, in the tribe Xoridini, from the position of the abdominal spiracles) is close—perhaps on the whole closer than with the Cryptinæ. I leave it in that group from the position of the abdominal spiracles. To the generic description (Manchr. Memoirs, xlvii. (v.), No. 14. p. 11) should be added, "Apex of clypeus with a minute tooth in the middle."

Cratojoppa cingulata, sp. nov.

Black; the face, clypeus, labrum, mandibles, except at apex, a line round the orbit, that on the outer becoming gradually widened below, a line on the base, top and bottom of prothorax, two lines, straight on the inner, rounded on the outer side on mesonotum, the scutellar keels, a line round the sides and apex of scutellum, post-scutellum, a mark, dilated to a fine point on the outer side, on the sides of the metanotum, a line down the centre of the basal half of metanotum, roundly contracted at the base, united below to a large mark covering the outer apical area, the apex dilated on to the edge of the spiracular, along which the outer edge is continued, the top of the mark being roundly incised; tubercles, sternum, the mark extending on to the pleuræ, the apices of all the abdominal segments, the lines on the second and third broader than the others, that on the fourth incised, and on the fifth interrupted in the middle—yellow. Four front legs yellow, the femora tinged with fulvous, the tibiæ and tarsi darker above; hind coxæ and trochanters yellow, the former largely and irregularly marked with black above, the femora reddish fulvous, their apical third black; tibiæ pale yellow, the apical third black; the tarsi white. Antennæ broadly ringed with white, the scape white below. Wings hyaline, the nervures and stigma black. ♂. Length, 15 mm.

Face and upper part of clypeus strongly but not closely punctured, the front and vertex very smooth and shining. Base and middle of mesonotum closely, strongly punctured; the sides sparsely punctured inwardly, outwardly smooth, as is also the whole of the apex. Scutellum strongly, deeply punctured, except along the edges; post-scutellum smooth. Areola smooth at the base, the rest finely, transversely striated, punctured along the sides. The lateral basal area with large, deep, clearly separated punctures in the centre; the apical lateral closely, deeply, strongly punctured; the apical slope strongly, transversely striated, the posterior median more closely, regularly, and

finely than the lateral. Pleuræ, except the middle of the pro- and the lower apical half of the mesopleuræ, strongly punctured, the metapleuræ more closely and strongly than the others. The first abdominal segment shining, smooth, except for a few scattered punctures on the post-petiole; the others closely punctured, strongly and closely on the second and third, weaker on the others. Disco-cubito nervure broken by a short stump; the transverse median received distinctly beyond the transverse median; areolet four-angled; the nervures meeting in front.

May be known from *C. maculata*, Cam., by the bands on the abdomen not being separated, but continuous. The differences between it and *C. robusta*, Cam. (which has the abdominal bands continuous) may be shown thus:—

Four front legs rufous, the yellow mark on the lower orbits of equal width, the black apical band on the hind femora half the length of that on the tibiæ . *robusta*.

Four front legs yellow, the yellow mark on the lower outer orbits much narrowed above, the black apical band on hind femora as long as that on the tibiæ . *cingulata*.

Acanthojoppa dudgeonii, sp. nov.

Ferruginous; the antennæ from the fifteenth joint, the depression at the base of metanotum, posterior median area, and the base of metapleuræ black; the basal part of antennæ, the face, orbits, and base of mandibles pale yellow; the wings yellowish hyaline, the apex from the radius fuscous violaceous, the costa and stigma testaceous, the nervures black. ♀. Length, 18 mm.

Head smooth, sparsely haired; the front in the middle above finely striated. Mesonotum alutaceous, finely, closely punctured at the apex. Scutellum closely, somewhat strongly punctured, and thickly covered with longish fuscous hair; the apex above broadly, roundly incised; the sides smooth, broadly rounded; the apical slope long, smooth, and bare at the apex. Post-scutellum bordered by a stout, rounded, curved keel; the base with some striæ. Areola large, six-angled, longer than its greatest width, its apex rounded inwardly, the base transverse; the lateral angle is in the middle; it is stoutly, irregularly, longitudinally reticulated; the basal lateral area stoutly, irregularly punctured, except round the edges; the second closely, stoutly, obliquely reticulated; the posterior median area closely, stoutly, transversely striated; the lateral stoutly reticulated; the spiracular area stoutly, obliquely striated, the striæ more or less twisted. Propleuræ closely, finely punctured above, below striated, strongly above, finely below; in the centre, below the middle, is a stout keel; the basal upper half of mesopleuræ with large clearly separated punctures, the apical upper half smooth, the lower part closely, coarsely, rugosely punctured; the metapleuræ closely, strongly, rugosely reticulated. Abdomen smooth; the second and third segments closely punctured, the former more strongly than the latter; the sheaths of ovipositor largely projecting, as long as the apical two segments united. The long spur of the hind tibiæ reaches to the middle of metatarsus. The transverse cubital

nervures are almost united in front; the disco-cubital nervure is broken by a short stump; the transverse median received beyond the basal.

This species has the wings yellowish hyaline, with a broad fuscous violaceous cloud, as in *A. nigrolineata*, Cam., from Assam; that species may be known from it by the areola not being longer than wide, and by the thorax being largely marked with black.

Buodias rufo-ornatus, Cam.

The female of this species has been taken at Buxa, Bhotan. In coloration it hardly differs from the male, the only difference of note being that there is a small irregular yellow spot in the centre of the base of the second abdominal segment. The basal half of the hind femora is rufous. In length it is 17 mm., the ovipositor is 6 mm.

OPHIONINÆ.

Paniscus longitarsis, Cam.?

A single specimen may be this species. The tarsi unfortunately are broken. The colour is of a deeper, more uniform rufous than it is in normal examples: the ocelli are distorted. The nervures are uniformly black, darker coloured than in *longitarsis*.

FOSSORES.

Pompilus capitosus, Smith.

The abdomen in the only example is covered with a purplish pile. The clypeus is yellow, except for a black mark, longer than wide, in the middle, its apex not reaching to the end. The four posterior spurs are yellow, black at the base. The second abscissa of the radius is twice the length of the third, which is as long as the space bounded by the third transverse cubital and the second recurrent nervure.

NOTES AND OBSERVATIONS.

STENOPTILIA GRAPHODACTYLA, A NEW BRITISH PLUME.—While collecting in East Dorset during the past summer, I had the good fortune to discover the larvæ of this pretty little moth feeding in the flowers of the marsh-gentian (*Gentiana pneumonanthe*), and several of the perfect insects were bred. I also beat one or two of them from amongst mixed herbage, but they seem to be sluggish in their habits, and only fly for a short distance after being disturbed. It occurred in boggy places on heaths, and, unless the larva feed on other plants, I do not think it is likely ever to be very plentiful, as marsh-gentian is excessively local. This form of *graphodactyla* is near to var. *pneumonanthes*, Schleich.—GERVASE F. MATHEW; Dovercourt, Essex, Nov. 22nd, 1906.

MYELOIS CERATONIE AND ITS VAR. PRYERELLA.—In an article by Mr. South (Entom. xxiii. p. 301) a reference occurs to the effect that

M. Ragonot held the opinion that *pryerella*, which at one time was considered a distinct species, was only a bleached form of *ceratoniæ*, and in this Mr. South concurred. During the winter (1904-5) I found at various times odd larvæ, to the total number of half a dozen, feeding in dates purchased in Liverpool. The fruits thus tenanted were put on one side, and towards the end of July, 1905, three moths emerged, while three of the larvæ had died, probably through injury when the fruit was opened. Later in the year I submitted the imagines to Mr. Eustace Banks, who found them to be as follows: One *M. ceratoniæ* (type), one var. *pryerella*, and one intermediate between the other two, but approaching *pryerella*. My object in writing the above is to call attention to the fact that *pryerella* is not a *bleached* form of *ceratoniæ*, but a good variety. It does not appear to be necessary for the elucidation of this point to do more than mention that the forms are—(1) type, grey; (2) *pryerella*; white, with very slight sprinkling of fuscous about the subterminal line on fore wings; (3) *intermediate*, like 2, but with rather more fuscous scaling. The last two both have ochreous suffusion along the costa and nervures of all the wings. Last winter, although carefully looked for, no larvæ were found. There is no external evidence of the presence of a larva in the fruit; it is only when opening a date to remove the stone that a tenant is detected. The larva lies along the stone, and makes no effort to escape; neither does it appear alarmed when suddenly exposed. I hope to be able to obtain more material for the study of this interesting species in the course of the present winter.—WM. MANBRIDGE; Liverpool.

LARVA OF LIMENITIS SIBYLLA.—Mr. W. J. Lucas's interesting note in the 'Entomologist' for December, 1906, on the early stages of *Limenitis sibylla*, brought to my mind W. Müller's elaborate paper, "Südamerikanische Nymphalidenraupen" (Zool. Jahrb., Bd. i., 1886, pp. 417-678). The author remarks on the habit of many genera allied to *Limenitis* of feeding in the larval condition from the tip of a leaf towards the stalk, so as to leave the midrib intact. These genera he accordingly groups together as "Rippenbanenden" (see especially pp. 553-561). In Taf. 14, fig. 15, he illustrates, by a striking figure of the young larva of a species of *Anæa* on a partly-eaten leaf of its food-plant, the protective resemblance between the larva itself and the fragments of leaf still left adhering to the midrib. This seems quite comparable with the means of protection employed by the young larva of *L. sibylla* to which attention is drawn by Mr. Lucas.—F. A. DIXEY.

THE MATHEW COLLECTION OF BRITISH LEPIDOPTERA.—On November 20th, 1906, the fine collection of British Lepidoptera formed by Paymaster-in-Chief G. F. Mathew, was dispersed at Stevens's. Altogether there were 524 lots, realizing a grand total of about £325. The prices obtained were fairly good on the whole, but there were some curious fluctuations in the bidding, and some of the purchasers must have congratulated themselves on the bargains they secured. Five specimens of *Chrysophanus dispar*, three males and two females, realized just under £10, although one of the females fetched 80/- and the other 40/-. Two examples of *Deilephila euphorbiæ* from Raddon's collection went for 8/-, and eight specimens of *D. galii* for about 5/- each. An example of *D. livornica*, taken in May, 1906, made a guinea, and one

of *Chærocampa celerio* 28/-. Of hybrid *ocellatus-populi* there were two examples, and each of these, together with four *S. ocellatus*, went for 20/-. Two yellow varieties of *Zygæna filipendulæ* sold for 20/-. *Arctia villica* is, as a rule, a fairly constant species, and such a range of aberration as that shown in Mr. Mathew's series is probably rarely seen in collections. The specimens numbered eighty-five in all, many were exceedingly nice varieties, and some were remarkable examples. Two, offered singly, realized 42/- and 65/- each; whilst several pairs were disposed of at from 35/- to 85/- per pair. Two lots, each comprising four of the old Cambridge specimens of *Lymantria dispar* and a few aberrations of *L. monacha*, made 11/- and 15/- respectively. Three fine dark forms of *L. monacha* sold for 28/-, but three others, perhaps rather darker, went for rather less than half that sum. A lot of twenty-six *Malacosoma castrensis*, including a nearly white female, brought in £3. British specimens of *Drepana sicula*, of which there were four specimens, seemed to be considered worth 10/- or 11/- apiece; but for the other species of *Drepana* the bidding was not keen. Three bred specimens of *Cerura bicuspis* from Tilgate Forest made 52/6, and two fine dark forms of *Stauropus fagi* 11/-. Hybrids from a cross-pairing of *Notodonta ziczac* ♂ and *N. dromedarius* ♀ sold for 9/-, 10/-, and 12/- each. Two lots of Leucanias, in which the plums were six, and five bred specimens of *L. vitellina*, made 35/- and 55/- per lot; four typical *L. albipuncta*, with twenty-three examples of other species, sold for 10/-; but two lots, including four *L. albipuncta* var. *rufa* in the one, and four var. *grisea* in the other, yielded 20/- and 35/-; a variety of *L. straminea*, with six other specimens of the same species and eight *L. impua*, fetched 12/-, but for a similar lot, including two varieties of *L. straminea*, the price ran up to two guineas. Of *L. jaricolor* no less than sixty-three specimens were offered, chiefly in lots of four examples. The types from which Barrett described the species sold for 24/-, and the cotype of ab. *ænea*, Mathew, for 95/-; three specimens of ab. *lutea-typica*, Tutt, made 57/6, and other named forms sold in lots of four specimens at from 22/- to 50/- per lot. *Senta maritima*, with various named aberrations, and examples of other species, went at 21/- a lot. One series of five *Tapinostola concolor* brought in 26/-, and another lot of five 30/-. Batches of six Irish and Kentish *Nonagria sparganii*, with some *N. typha*, found buyers at 22/- and 30/-. Some curious forms of the *Hydræcia* named *paludis* went in lots of three dozen or more, at prices varying from 21/- up to 37/6. There were several specimens of *Hama* (*Mamestra*) *abjecta* v. *variegata*, which so closely resembles the variegated form of "*Apamea*" *gemina*, but we only caught the price obtained in the case of one lot, in which there were four examples of the variety; this was 40/-. Eight fine specimens of *Agrotis hyperborea* (*alpina*) reached 29/-, and three others, with a nice variable series of *Tæniocampa incerta*, went for 11/-. One example of *Orrhodia erythrocephala* from Lewes (ex. coll. S. Stevens) sold for 16/-. For *Dianthæcia luteago* var. *barrettii* the price was about 4/- each, and, although eight specimens of *Polia nigrocincta* (five very fine), with other things, went for 12/-, another lot of seven very fine *nigrocincta* alone made 21/-. A lot of *Aplectas*, in which two examples of *A. nebulosa* var. *robsoni* were included, were sold for 37/6. The sum of 35/- was given for a specimen of *Crymodes exulis* from Rannoch.

Bred specimens of *Xylomyges conspicillaris* from Taunton made about 5/- each, and others, also bred, but locality not indicated, fetched 1/- more per specimen. Eleven shillings was given for one example of *Xylina conformis* from Bathampton. There were six specimens of *Cucullia gnaphalii*, and these made 53/-. Two lots of *Plusias*, each comprising eight specimens of *P. bractæa*, with seven *P. chryson*, and eight *P. festuæ*, were sold for 40/- and 32/6 per lot. Of *Catocala fraxini* there was a specimen from Glynde, Sussex, and for this the bidding went up to 47/6. The first known British specimen of *Nyssia lapponaria* was taken about thirty-five years ago, and up to 1895 it remained unique. The ten specimens of this species in Mr. Mathew's collection, offered with other things in two lots, brought in 58/-; so that 6/- would seem to be the present auction price, whereas the original specimen was once sold in the same rooms for the tall price of £14. The aberrations of *Abraxas grossulariata* were numerous. Six of the best of these brought in a total of £10 12s. 6d., which included 65/- for one female ab. *lutea*, 45/- for a male of the same form, and 35/- for a specimen of *fulvaticata*.

CAPTURES AND FIELD REPORTS.

SESIA CULICIFORMIS AND HELIOTHIS PELTIGERA IN DORSET.—On June 4th, 1906, I captured in Berewood, Dorset, nine specimens of *Sesia culiciformis*, and two examples of *Heliothis peltigera*, and on June 10th one further *S. culiciformis*. The Sesiids came to the blossoms of the rhododendron, and visited exclusively the common purple one, although there were many plants in full bloom of the beautiful nursery variations. They flew almost exclusively during the very hottest sunshine, when even the active *Argynnis euphrosyne* seemed overcome by the heat. They were very wary, and I missed the first four that I saw. However, after I had got used to the tactics of the insects I caught nine out of ten, making a total of fourteen seen. It was quite impossible, once they had jumped, to follow them amongst the maze of flies, bees, and wasps dancing around the bushes. The one captured on the 10th was worn and was, moreover, the only one seen, so presumably the brood was over. Of the *Heliothis peltigera*, one was flying at purple bugle, and the other was imprisoned in a rhododendron flower. The adhesiveness of the pistils, stamens, and stems of the rhododendron flower is wonderful, nearly every *Sesia culiciformis* was a leg or more short, and *H. peltigera* lacked the apex of the right fore wing, which, when I endeavoured to dislodge the insect, remained sticking to the pistil. I found remains of several insects, including *culiciformis*, in the flowers. They had evidently met their death in the same way as a house-fly on a "fly cemetery." I saw a queen wasp get stuck, and after repeatedly stinging the pistil she bit it through at the base and fell out of the flower to the ground, still endeavouring to disengage herself from the pistil. Owing to the thickness of the bushes I was unable to see whether the efforts were successful. The interest of the capture of *Sesia culiciformis* lies in the fact that I only know of two records for Dorset; one by J. C. Dale in

1865, and one by the Rev. F. H. Fisher *circa* 1894.—W. PARKINSON CURTIS, Poole.

CHEROCAMPA CELERIO IN SELKIRKSHIRE.—On October 13th a specimen of this fine moth was found by a little girl in Galashiels, and brought to her teacher, who sent it to Mr. William Shaw in the same town—an enthusiastic botanist and entomologist—for identification. Mr. Shaw says the insect is in very fair condition, being only a little rubbed on the tip of one wing. He has not heard of it in this country side since 1873, when his brother took one in Berwickshire.—B. WEDDELL.

DEIOPEIA PULCHELLA IN IRELAND.—A young cousin of mine caught a specimen of *D. pulchella* on the Ballivane Road, Cork, on October 24th, between 11 o'clock and noon. He sent it to me in a match-box, alive, and it arrived in good condition. I believe this to be a rare and valuable moth, and should be much obliged if you can give me any information concerning it, as I have not seen one before, and have not heard of a British specimen being captured for a good many years.—ROSE M. DAKIN; Frappenhall, Cheshire, November 22nd, 1906.

[In the 'Entomologist,' vol. xxv. pp. 152-155, the records of *D. pulchella* in Britain are discussed, and a table given, showing the years, up to 1892, in which the species occurred in, or was apparently absent from, our islands. Since 1892, when about twenty specimens were captured, only odd examples have been observed. Of these one was taken in July, 1894, one in August of the same year, and one in 1895. One or two were reported to have been found under exceptional circumstances in 1901. The records for 1906, so far, are only three: one from Sussex, one from West Cornwall, and one from Cork, Ireland. Probably there had been a migratory movement of the species last autumn in the direction of the British Isles, but if so, it would seem that only a very few individuals effected a landing here.—ED.]

OCCURRENCE OF XANTHIA OCELLARIS, Bkh., IN NORFOLK.—Mr. R. S. Smith, Junr., of Downham Market, has recently submitted a Noctuid to me for identification. I saw at a glance that it might be *X. ocellaris*, and a reference to Barrett's 'Lepidoptera' convinced me that I was right. This specimen was a male, and in very fine condition. Mr. Smith tells me that he captured it in West Norfolk, the first week in September of this year. He also states that he has another specimen, not in such fine condition, which was taken by himself in the same district two years ago. I am aware that this rare species has been taken in Suffolk, but I believe this is the first record of its occurrence in Norfolk; it will therefore be a very welcome addition to our county list.—E. A. ATMORE; King's Lynn, Norfolk, November, 1906.

LAPHYGMA EXIGUA IN DEVONSHIRE. — Six specimens of *Laphygma exigua* (identified by Mr. Rowley, Curator of the Exeter Museum) were taken here, at light, in August last. Four of the examples are in bred condition.—J. POPE; 11, Portland Street, Newtown, Exeter.

HELIOTHIS ARMIGERA IN CORNWALL: A CORRECTION.—I regret to find that in error I recorded *Heliothis armigera* as observed by me in North Cornwall and Corsica, during the past summer (see 'Entomologist,' xxxix. p. 230). I find, on comparing the specimens, which are very

worn, with those in my cabinet, that they are undoubtedly *H. peltigera*.
W. S. SHELDON; Youlgreave, South Croydon.

LEUCANIA UNIPUNCTA IN HAMPSHIRE.—On September 12th last I took a specimen of *L. unipuncta*, Hw. (*extranea*, Gn.) in good condition, at sugar, near the village of Burley, in the New Forest.—A. R. KIDNER; 139, Rosendale Road, West Dulwich, S.E., December 17th, 1906.

TENIOCAMPA STABILIS IN NOVEMBER.—While working ivy on November 21st last, I took a male specimen of the above-named moth.—G. B. CONEY; The Hall, Batcombe, Somerset.

OCCURRENCE OF SPILOSOMA MENDICA IN NOVEMBER.—I took a good specimen of *S. mendica* on November 6th last.—H. J. BAKER; Winterbourne, Wain-a-long Road, Salisbury.

RETARDED EMERGENCE OF DEMAS CORYLI.—On November 17th last a fine male *D. coryli* emerged from the pupa: is not this a very unusual occurrence? I may mention this was not an isolated pupa, but was one of a large brood from which the bulk of the imagines emerged during the first week in July.—J. B. MORRIS; 14, Ranelagh Avenue, Barnes, November 25th, 1906.

DASYCHIRA PUDIBUNDA EMERGING IN AUTUMN.—Out of a large batch of ova laid on June 2nd last, by a female of *D. pudibunda*, L., taken in the New Forest, I had about twenty. Twelve of the larvæ were allowed to feed up, and pupated between August 8th and 26th. The pupæ were placed in an unwarmed conservatory. A female moth emerged on September 9th; five males and three females between October 1st and 12th; a male on November 3rd; and another on the 27th. The last pupa is still alive. Pupæ of several other species are being kept in the same boxes; but none have shown any signs of departing from their normal season of emergence. Several moths, however, have been reared by friends from other ova laid by the same female, which were not treated exceptionally in any way.—A. R. KIDNER; 139, Rosendale Road, West Dulwich.

PLUSIA MONETA IN CHESHIRE.—In the record, Entom. xxxix. p. 291, after "captured in his house," add "at Sale, Cheshire."

MIGRANTS.—The year 1906 will be famous for the clouds of ants which suddenly appeared in this corner of Kent. Apparently they stretched or travelled from Deal to Margate, about a dozen miles as the crow flies. Hitherto I was rather incredulous about such visitations, and it is still a mystery to me how these little flies—as ordinary people call them, and which were found to be winged ants—can be carried miles away from their breeding-place and dumped down indiscriminately. Amongst migratory Lepidoptera this season has produced little that is noteworthy. *Pyrameis cardui* has been in evidence sparingly, both worn specimens in early summer, and brightly coloured ones in September; but apparently the Eastbourne, &c., migration did not reach us. *Vanessa io* was very scarce; one specimen occurred indoors, in Margate, the first seen for several years; *V. polychloros*, also indoors; this is the first example I have seen in Margate in twenty-five years. *Colias hyale*, one specimen seen and missed, but afterwards

captured by some boys; *C. edusa*, twenty to thirty seen, and some captured. *Aporia crataegi*, no longer a migrant, but is probably affected by climatic conditions. I captured a battered female miles away from the headquarters, but failed to find another specimen. I consider the species naturalized. *Acherontia atropos*, no record this season. Last year one collector bought and sold over a thousand pupæ, dug up in Thanet; after their journey by rail the emergences were nil. *Macroglossa stellatarum*: I place this species amongst those which come to us from the Continent. This autumn it has turned up frequently indoors, and I have some still alive. *Nonagria sparganii*: this species has either invaded my locality, or I have discovered its habits.—J. P. BARRETT; St. John's Villas, Margate.

SUGARING AND ATMOSPHERIC CONDITIONS.—My experience of sugaring early in September, 1906, leads me to think that atmospheric conditions, even when the weather appears normal, greatly affect the number of moths that come to sugar. I sugared some posts here, as soon as the waning moon permitted sufficient darkness, and the catch was very insignificant. I set five specimens out of possibly a hundred which put in an appearance. As the posts numbered exactly eighty, the average was a little over one moth per post. A few days later I sugared again, the same mixture, the same quantity; but the posts retaining their sweetness I found I had some sugar left, and so increased the number of posts to exactly one hundred. In my entomological career I have had good nights. Once I calculated there were 2500 moths on the sugar, but that night in early September of 1906 easily beat my old record. The moths—about nine-tenths being *Noctua xanthographa*—were very quiet on the sugar, in some instances very closely packed, and fortunately the "skittish" *Xylophasia polyodon* was nearly over. Occasionally a moth in the centre would startle the rest, and they fell off in a patch, but quickly returned. I made a careful estimate, although it took me all my time to look for "plums" amongst so much "dough," and I reckon at least five thousand moths had a supper at my expense—at least fifty per post. I selected fourteen moths out the lot, and these included two very fine *Laphygma exigua*, one *Caradrina cubicularis*, and the rest were mainly *N. xanthographa*. Perhaps twenty-five species contributed to the total. Later on I sugared again, and on no evening did the total exceed an estimate of two hundred and fifty, sometimes falling below one hundred.—J. P. BARRETT; St. John's Villas, Margate.

ODONATA RECORDS FOR 1906:—HERTFORDSHIRE—Shenley: *Symptetrum striolatum*, plentiful in August and September. *Anax imperator*, male, August 6th. *Æschna cyanea*, abundant in September. *Æ. grandis*, plentiful. *Ischnura elegans*, abundant; last observed on August 29th. *Agrion puella*, abundant. *Enallagma cyathigerum*, abundant.

BUCKINGHAMSHIRE—Eton: *Æschna cyanea*, abundant in September and October. *Ischnura elegans*, very abundant; first observed on June 3rd. *Calopteryx splendens*, very abundant; first observed on June 3rd. *Agrion pulchellum*, very abundant; first observed on May 24th; last observed on July 22nd. *A. puella*, not very plentiful. Burnham Mill-pond: *Ischnura elegans*, very abundant. *Agrion puella*, male,

June 12th. *Enallagma cyathigerum*, males abundant, females not observed.

BERKSHIRE—Swinley Forest; Ascot: June 23rd, *Libellula depressa*, male (not captured). *L. quadrimaculata*, male (not captured). *Anax imperator*, male (not captured). *Agrion puella*, plentiful.

SOMERSETSHIRE—Shirehampton (near Bristol), September 15th, *Æschna cyanea*, female. September 17th, *Sympetrum sanguineum*, males (not captured); *Æ. cyanea*, female; *Æ. grandis*, female (not captured).—E. R. SPEYER; November 27th, 1906.

NOTES ON LEPIDOPTERA REARED DURING 1906.—From ova deposited by a female *Angerona prunaria*, taken at Bricket Wood, near Watford, on June 27th, 1905, I have this year reared a number of specimens. The moth laid over three hundred eggs, and the young larvæ were sleeved on plum. In the autumn I divided the brood, giving part to my friend Mr. A. E. Gibbs, of St. Albans. The larvæ which I retained were kept in bags in a shed during the winter, and in the spring part of them were sleeved out again, and the others placed in breeding-cages, and supplied with plum, birch, and lilac. The first began to spin up on May 20th, but some of those in the sleeves out of doors did not do so until about June 15th. The dates of emergence of the perfect insects were as follow:—June 17th, two males; 18th, one male, one female; 19th, three males; 20th, ten males, seven females; 21st, sixteen males, thirteen females; 22nd, four males, seven females; 23rd, seven males, five females; 24th, three males, four females; 25th, one male, six females; 26th, one male, one female; 27th, two males, one female; 28th, two females. July 2nd, two females; 4th, one female. Of these, twenty-six males and twenty-six females were of the type form, and twenty-one males and twenty-five females of the banded form (var. *corylaria*). In addition to these, one male was a cripple, and nine more (males) failed to make good their escape from the leaves enclosing the cocoons. This was owing, I think, to the leaves (plum in most cases) becoming so shrivelled and hard that the moth was unable to force a way out. In future I shall remove the pupæ from the cocoons, and put them in moss. Mr. Gibbs bred sixty-four moths, nineteen males and eighteen females of the type form, and fourteen males and thirteen females of the var. *corylaria*. The total number of imagines obtained from the one brood was one hundred and seventy-two. The moths I bred show a certain amount of variation. One male of the type form has the ground colour of rather deeper orange than usual, and the dark strigulation strongly developed. Two males of the var. *corylaria* form have the band on the hind wings of a greyish colour, and some have the orange spot at the apex of the fore wings almost wanting, while in others it is so much enlarged that it joins the median band. The females of the var. *corylaria* form vary somewhat in the depth of the colour of the dark border, and also in the size of the yellow spot at the apex of the primaries, but the latter does not join the median band in any of the specimens.

In May, Mr. Gibbs gave me some ova of *Nyssa lapponaria*, laid on April 21st and 22nd by a female from the Rannoch district. They began to hatch on May 20th, and were all out by the 23rd. The eggs are bright green when laid, and turn a beautiful steel-blue colour

before hatching. I started them on birch, but in spite of every care they rapidly dwindled in numbers. Later I sleeved some on apple, but only a few fed up properly. In the end I have but fifteen pupæ from over two hundred eggs.

On May 6th I joined Mr. A. L. Rayward in the morning at Box-hill to beat for *Boarmia abietaria* larvæ, but we soon discovered from the battered appearance of the trees that we had been forestalled by someone evidently possessed of a strong arm and thick stick. On comparing notes at the end of four hours' continuous work, we found we had just a dozen larvæ apiece, and a few of other species. *Lithosia deplana* larvæ were beaten in some number, but we did not take many, as it is almost impossible to breed the moths when the larvæ are taken young. We subsequently beat a few juniper-bushes, and secured a lot of *Eupithecia sobrinata* larvæ. These soon spun up in moss, and the moths emerged from July 27th onwards.

I was rather anxious to rear *Euchloë cardamines* from the egg, and caught a female at St. Albans on May 13th. This I placed in a cage with some hedge-mustard, and kept in the sun. The butterfly did not begin to lay till the 19th, and then only a few eggs were deposited. The first hatched on the 24th, and the others shortly after. They began feeding well, but, owing to cannibalism or some other cause, only one reached the pupa state on June 24th.

On June 3rd, in the Wye Valley, I found about forty *Tæniocampa miniosa* larvæ on a twig of oak. They were then half an inch long, and fed up very rapidly on oak, commencing to pupate on June 19th. On June 4th, in the same locality, I took about twenty larvæ of *Sylepta (Botys) ruralis* from a bed of nettles. These all pupated in a few days. The pupa is five-eighths of an inch long, slender, very shiny black, abdomen pointed. The moths began to emerge July 3rd.

The moths resulting from the *Boarmia abietaria* larvæ mentioned above emerged between June 24th and the middle of July—two males and six females, nearly all of a very dark form.

Several of the *Tæniocampidæ* were reared from the egg to the pupa state, but failures were experienced with *Melanippe hastata*, *Ephyra punctaria*, *Epione advenaria*, and others.—PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, November 7th, 1906.*—Mr. F. Merrifield, President, in the chair.—Mr. Gerard H. Gurney, Keswick Hall, Norwich; Mr. Harold Armstrong Fry, P.O. Box 46, Johannesburg, Transvaal Colony; Mr. Frederick Albert Mitchell-Hedges, 42, Kensington Park Gardens, London, W.; Mr. Gordon Merriman, Trinity Hall, Cambridge; Mr. Percy A. H. Muschamp, 20, Chemin des Asters, Geneva; and Mr. Oswin S. Wickar, Crescent Cottage, Cambridge Place, Colombo, Ceylon, were elected fellows of the Society.—Mr. H. J. Lucas exhibited a photograph of *Panorpa germanica*, practically immaculate, taken at Tongue, Sutherlandshire, and a typical form for comparison, corresponding apparently to the *borealis* of Stephens. He also showed a series of

other members of the genus to illustrate the range of spotting on the wings of both sexes.—Mr. G. C. Champion showed a long series of a *Henicopus* (probably *H. spiniger*, Duval), from El Barco, Galicia, Spain, to demonstrate the dimorphism of the females.—Mr. H. St. J. Donisthorpe exhibited seven specimens of *Prionocyphon serricornis*, Müll., bred from larvæ taken in the New Forest in July, living larvæ, and a larva and pupa figured, of the same, and read a note on the species.—Dr. T. A. Chapman brought for exhibition a collection of butterflies, made in Galicia (lat. $42^{\circ} 16' N.$, long. $6^{\circ} 44' W.$) last July, including (a) specimens of *Lycana idas*, hitherto reported only from the Sierra Nevada, and therefore a surprise in the extreme north-west. It occurred at an elevation of 4500 to 5000 feet, and only where there grew a species of *Erodium*, with extremely large handsome flowers; (b) specimens of *L. argus* (*ægon*) from the same district, which though close to the vars. *hypochiona* and *bejarensis*, differed in a certain proportion of the specimens presenting the red of the marginal "peacock eyes" on the upper surface of the hind wings of the males.—The Hon. N. C. Rothschild exhibited branches of *Viburnum lantana* showing the mines of *Sesia* (*Egeria*) *andreniformis*, now discovered by him as the food-plant of the species in Britain for the first time.—Mr. E. Dukinfield Jones exhibited two species of the genus *Molipa*, bred from Brazilian larvæ which were identical in form. He also showed photographs of the larvæ *in situ*.—Mr. F. A. Dixey exhibited specimens of Pierine butterflies, selected to illustrate the various conditions under which pigment might be replaced by black. He said that in his opinion melanism, though it might arise as a sport or as a variation, owed its establishment and increase to the principle of selective adaptation.—The President mentioned a bug, which Mr. Cecil Floersheim had found very destructive to the eggs of *Papilio machaon* and *P. asterias*, as a remarkable instance of a species of carnivorous *Heterotoma*.

Wednesday, November 21st.—Mr. F. Merrifield, President, in the chair.—The Secretary read the list of fellows nominated to serve as officers and other members of the Council for the session of 1907-8.—Mr. Walter E. Collinge, M.Sc., of 55, Newhall Street, Birmingham, and Mr. H. S. A. Guinness, of Balliol College, Oxford, were elected Fellows of the Society.—Mr. H. W. Andrews exhibited specimens of *Odontomyia angulata*, Pz., from the Norfolk Broads, a species few captures of which have been recorded of recent years, and *Icterica westermanni*, Mg., a rare Trypetid, taken by him in the New Forest.—Dr. F. A. Dixey showed specimens of South African Pierinæ demonstrating that the wet-season form of *Teracolus regina*, Trim., was in mimetic association with an undescribed species of *Belenois*, intermediate between *B. calypso* and *B. thysa*.—Mr. W. J. Lucas exhibited, on behalf of Messrs. H. and F. Campion, a male specimen of *Sympetrum vulgatum* taken in Epping Forest on the 4th September last, of which species only three other authentic British specimens are known.—Mr. R. Adkin exhibited a short series of *Tortrix pronubana*, Hb., including both sexes, which he had reared from larvæ and pupæ collected from *Euonymus* at Eastbourne in September last. The only previous records for the species in Britain are single male examples captured at Eastbourne and at Bognor respectively in the autumn

of 1905.—Dr. T. A. Chapman exhibited a long series of *Canonympha mathewi*, Tutt, from different places in the north-west region of Spain (Galicia), and gave it as his opinion that it must be regarded as a geographical or subspecific variety of *C. dorus*, and not a fully established species.—Professor E. B. Poulton, F.R.S., communicated “A Permanent Record of British Moths in their Natural Attitudes of Rest,” and “Further Notes on the Choice of a Resting-site by *Pieris rapæ*,” by Mr. A. H. Hamm; Mr. R. Shelford, M.A., F.L.S., “Studies of the Blattidæ,”; the Hon. N. Charles Rothschild, “Notes on the Life History of *Sesia andreniformis*, Lasp.,” and Mr. Hubert W. Simmonds, “Notes on an Unusual Emergence of *Chrysophanus salustius* in New Zealand.”

Wednesday, December 5th.—Mr. F. Merrifield, President, in the chair.—The Hon. Secretary announced that the Halliday correspondence had been presented to the Society by Dr. E. Percival Wright, of Trinity College, Dublin.—Mr. H. C. Pratt, Government Entomologist, Federated Malay States, Kuala Lumpur; Capt. H. J. Walton, M.B., F.R.C.S., Indian Medical Service; Mr. Arthur Ernest Gibbs, F.L.S., Kitchener's Meads, St. Albans; Capt. James Bruce Gregorie-Tulloch, King's Own Yorkshire Light Infantry; Mr. John Ashburner Nix, Tilgate, Sussex; Mr. Herbert W. Southcombe, J.P., 16, Stanford Avenue, Brighton, and Mr. Roland E. Turner, 21, Emperors Gate, N.W., were elected Fellows of the Society.—Mr. A. W. Bacot exhibited a specimen of *Catocala nupta*, taken at rest at Hackney, November 9th, 1906, remarkable for having two well developed tarsi on the left fore-leg. Also three female specimens of *Lasiocampa quercus*, L., bred from larvæ from Cornwall in 1906. One of these larvæ had been submitted to a pressure of from seventeen to thirty atmospheres (405 to 450 lb. per square inch) on two occasions; a pressure which had proved fatal at once to a frog, used as a control experiment. A discussion followed in which Dr. F. A. Dixey, Dr. Greenwood, and other Fellows joined.—Dr. T. A. Chapman—who exhibited a long series of *Hastula hyerana*, Mill., bred this year from larvæ collected at Hyères, and a diagrammatic map of the neighbourhood, to explain the distribution of the species in that area—pointed out that there were two colonies of *H. hyerana*, in one of which the melanic specimens were three times as numerous as in the other.—Dr. F. A. Dixey exhibited specimens of *Teracolus omphale*, Godt., bred by Mr. G. A. K. Marshall. The exhibit showed that under arranged conditions of moisture and warmth the wet-season phase might be artificially induced.—Mr. L. B. Prout read a paper entitled “*Xanthorhœ ferrugata*, Clerck, and the Mendelian Hypothesis.”—Dr. F. A. Dixey communicated a paper “On the Diaposematic Resemblance between *Huphina corva*, Wallace, and *Ixias baliensis*, Fruhst.”—H. ROWLAND-BROWN, M.A., Hon. Secretary.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
—November 8th, 1906.—Mr. R. Adkin, F.E.S., President, in the chair.—Messrs. Harrison and Main exhibited bred variable series of (1) *Tethea subtusa*, from Fermanagh, and (2) *Numeria pulveraria*, from various localities, and pointed out the characteristic forms prevailing in each.—Mr. Newman, (1) *Anthrocera* (*Zygæna*) *purpuralis* (minos),

from North Wales; (2) a dwarf example of *A. exulans*; (3) a pale *A. filipendulæ*; and (4) a very variable series of *Chrysophanus* (*Humicia*) *phleas*, the pick of some three thousand third brood specimens passed through the net at Bexley.—Mr. Moore, a specimen of *Vanessa* (*Aglaïs*) *urticæ* very nearly approaching var. *polaris*.—Mr. Goulton, a specimen of the rare *Heliothis armigera* taken at light at Sutton, and a series of *Sesia* (*Egeria*) *myopæformis* from the same locality.—Mr. Edwards, some large species of Coleoptera from Sierra Leone.—Mr. Rayward, ova of *Thecla* (*Strymon*) *w-album* found *in situ* on bark and twigs of wych elm.—Mr. R. Adkin, a series of *Scoparia dubitalis*, from Eastbourne, including some exceedingly pale forms, together with a similar pale example from the Barrett collection, and read notes on this local race.

November 22nd, 1906.—The President in the chair.—A Special Exhibition of Varieties.—Mr. South exhibited the large Chinese var. *chinensis* of *Vanessa urticæ* to compare with the very small *V. urticæ* ab. *urticoides* bred from larvæ fed on hop.—Mr. Lucas, for Messrs. F. W. and H. Campion, (1) a male of the very rare dragonfly *Sympetrum vulgatum*; (2) a series of *S. flaveolum*, including a female; and (3) a series of *Cordulia aenea*—all were taken in Epping Forest.—Messrs. Harrison and Main, (1) a brood of *Pieris brassicæ*, including examples of the female, in which the two discal spots on both upper and under sides were more or less united into a band; (2) series of *Aplecta nebulosa*, from Delamere, Epping, and New Forests for comparison; (3) bred series of *Tephrosia biundularia* from the New Forest and from Delamere—the former light, the latter dark and intermediate; (4) bred examples of *Dianthæcia casia* from the Isle of Man; (5) *Acronycta alni* from the New Forest.—Mr. Kaye, a captured specimen of *Apatura iris* from the New Forest, measuring $3\frac{1}{8}$ in. in expanse, much larger than any bred specimen.—Mr. Dobson, four species of the genus *Sympetrum* taken in one place in Surrey on September 3rd—*S. striolatum*, *S. flaveolum*, *S. sanguineum*, and *S. scoticum*; he also showed series of sixteen species of bees of the genus *Bombus*.—Mr. G. B. Brown, his captures during a ten days' holiday at Deal in late July, including *Lithosia lutarella* (*pygmæola*), *Calamia phragmitidis*, *Agrotis tritici*, *Eremobia ochroleuca*, *Dianthæcia cucubali*, &c.—Mr. P. J. Barraud, a series of dark and intermediate forms of *Xylophasia monoglypha* from St. Bees, Cumberland.—Mr. South, a short series of unusually large examples of *Dichrorampha flavidorsana* from his garden, and read notes on its distinctness and occurrence.—Mr. Tonge, the Lepidoptera taken by him on the Suffolk coast in July, including *Trochilium apiformis*, *Mamestra abjecta*, *Leucania straminea*, *Senta maritima*, *Acidalia emutaria*, &c., together with a series of admirable photographs of the natural resting positions of numerous species of butterflies and moths.—Mr. Goulton, varied series of *Oporabia diutata*, *Melanthia ocellata*, and *Ypsipetes sordidata* (*elutata*), from Ranmore Common, the last comprising black, banded, green, wainscot, and other forms.—Mr. Lucas, *S. vulgatum*, males, from Richmond Park and from Denmark, and also drawings of the male genitalia of *S. striolatum* and *S. vulgatum*, as well as photo-micrographs of the former male.—Mr. Chittenden, melanic *Larentia multistrigaria*, from York, dark *Hadena adusta*, from Rannoch, dark *Ypsipetes impluviata*, from Arran, &c.—Mr. Clark, the ichneumon,

Ophion luteum, taken on November 21st. — Mr. R. Adkin, a series of *Tortrix prunabana* reared from larvæ collected at Eastbourne from euonymus in September last, only two specimens having been obtained previously in this country; he also showed an asymmetrical specimen of *Macroglossa stellatarum*, the transverse lines of the left fore wing uniting into an irregular patch. — Mr. Sich, two imagines, with cases, of what he thought were *Coleophora milvipennis*; and also German examples of *Valeria oleagina*, *Catephia alchymista*, &c. — Dr. Chapman, (1) a long series of a new species of *Cænonympha* from Galicia, Spain, viz., *C. matheui*, closely allied to *C. dorus*; (2) a series of *Lycæna idas*; (3) a series of *L. ægon* with red on the hind margin of the hind wings; (4) a number of *Erebia palarica*—all three species from Galicia; and (5) a representative exhibit of *Hastula hyerana* and its forms from Hyères. — Mr. T. W. Hall, white blotched varieties of *Arctia villica* and a *Eupithecia* showing the characters of both *E. minutata* and *E. assimidata*. — Dr. Hodson, (1) *Lycæna (Agriades) corydon* with light outer margins; (2) *Lycæna (Polyommatus) icarus* with large blotches of black replacing the orange on the under side of the hind wings; (3) *Lycæna (Aricia) agestis* with the markings along the outer margins conspicuously wedge-shaped. — Mr. Garland, for Mr. Pickett, (1) a gynandrous example of *Angerona prunaria*; (2) a specimen of *Ematurga atomaria* with six wings; (3) a long series of *Hemerophila abruptaria* showing many melanic forms; (4) fine aberrations of *Lycæna (Agriades) corydon* from Dover this year; (5) a light specimen of *Melitæa cinxia*; and (6) a very pale *Pararge egeria*. — Mr. West, Greenwich, cabinet-drawers containing his collection of British Chrysomelidæ, Endonychidæ, Coccinellidæ, &c. — Mr. Gadge, a wire arrangement to affix to flower-pots for breeding purposes, which could be folded up when not in use. — Mr. West, of Ashstead, exhibited under the microscope curious Y-shaped scales of *Pseudopontia paradoxa*, received from Mr. Moore. — HY. J. TURNER, *Hon. Report. Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
Oct. 16th, 1906.—Dr. T. A. Chapman exhibited a series of *Pterophorus brachyductylus*, bred, 1906, from ova laid by imagines bred from larvæ taken in Switzerland in May, 1905.—Mr. J. A. Clark, melanic *N. xanthographa*, from Dalnaird Bridge. — Mr. T. H. L. Grosvenor, *Cænonympha davus*, the type from Aberdeen, and var. *rothliebii*, from Witherslack and Penryth.—Mr. G. H. Heath, *Anchocelis lunosa*, varying from dark brown to sand-coloured specimens, Sandown, Isle of Wight.—Dr. G. G. C. Hodson, *Euchloë cardamines*, male, with orange tip broken up into alternate stripes of orange-yellow.—Mr. L. W. Newman, *Agrotis obelisca*, *Aporophyla australis*, *Anchocelis lunosa*, *Laphygma exigua*, *Bryophila (Jaspidia) muralis*, and *Lycæna corydon*, taken at Sandown, Isle of Wight, September 8th to 16th. *L. exigua* showed considerable variation in ground colour.—Mr. L. B. Prout, *Polia xanthomista*, from Bude. — Mr. V. E. Shaw, full-fed larvæ of *L. exigua*; also bred *Ellopiia fasciaria*, from Tyne Valley, some specimens being darker than the usual Southern form. — Mr. Alfred Sich, *Heliothis peltigera*, bred from Dorset ovum, the imago having emerged within forty-two days of the hatching of the larva.—Mr. H. E. Tautz, *L. exigua*, taken at Pinner.—Mr. A. J. Willsdon, melanic *T. ianthina*, bred *ab ovo* from

New Forest; also series of *Orthosia upsilon*, *Miselia oxyacanthæ*, *Tæniocampa instabilis*, and *T. opima*, from Epping, the latter including very dark specimens.—Mr. Prout stated that larvæ of *L. exigua*, kept in a warm room, had pupated twenty days after emergence from the egg.

November 6th.—Dr. G. G. C. Hodgson exhibited *Thera juniperata* from Surrey, and a long series of *Lycæna ægon* from Witherslack and Ashdown Forest, including an almost grey male, and several aberrant under sides.—Mr. G. H. Heath, *Heliothis peltigera*, Sandown, September, 1906, and *Hadena proteus*, closely resembling Newman's third figure, from same locality.—Mr. L. W. Newman, a long series of *Chrysophanus* (*Polyommatus*) *phlæas*, Bexley, September and October, 1906, including a golden-coloured specimen, several intermediates between this form and type, and examples of striated, brick-red, and almost white under sides.—Mr. V. E. Shaw, *Asthenes blomeri* from Chalfont Road, June, 1906.—The evening was devoted to the exhibition and exchange of members' duplicates.

November 20th.—Messrs. L. A. E. Sabine and H. B. Whitehouse were elected members of the Society.—Mr. S. J. Bell exhibited two broods of *Hemerophila abruptaria*, bred from pupæ received from Mr. E. Harris. Brood A, from light female and dark male ex light female and dark male, yielded 80 per cent. dark and 20 per cent. light; brood B, from dark female and male ex dark female and light male, yielded 96 per cent. dark and 4 per cent. light. Brood A consisted of 48 per cent. male and 52 per cent. female, but in brood B there were 66 per cent. female and only 34 per cent. male. In over one hundred specimens shown there was nothing approaching to an intermediate form.—Rev. C. R. N. Burrows, nine *Epunda lutulenta*, the only examples of the grey form found among some two hundred specimens taken at Mucking.—Mr. J. A. Clark, *Agrotis ashworthii*, North Wales, August, 1906; and series of *H. abruptaria*, including a gynandromorphous specimen.—Mr. G. R. Garland, on behalf of Mr. Pickett, long series of bred *H. abruptaria*—first, second, and third broods of type, and dark forms from Clapton, including a small slate-coloured male.—Mr. G. H. Heath, *Cerastis spadicea*, Sandown, October, 1906, with pale submarginal line strongly marked.—Mr. L. W. Newman, *Zygæna minos* from North Wales and Oban, June, 1903; also a *Zygæna* taken at Oban at the same time, having six spots on fore wings, but with the fluffy body characteristic of *Z. minos*.—Mr. L. B. Prout, aberrations of *Aporophylla australis*, Sandown, September, 1906, including strongly marked males and female of rare ab. *ingenua*; also six examples of *Acidalia immorata*, bred as a partial second brood from Lewes ova.—Mr. V. E. Shaw, long series of *H. abruptaria* from Holloway, Clapton, and Bexley, including many dark specimens.—In the course of a discussion on *H. abruptaria* it was made evident that the dark form had long been known in the Clapton district, where Mr. E. Harris took the female from which most of the dark specimens exhibited were descended, and that this form was apparently gaining ground there.—S. G. BELL, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The usual monthly meeting of this Society was held at the Royal Institution, Liverpool, on November 19th, 1906, Mr. R. Wilding, Vice-President, in the chair.—A paper was communicated by Mr. J. Collins, of Oxford,

embodying his observations upon the habits of *Sitaris muralis*, a beetle associated with the mason bee, *Anthrophora pilipes*, with specimens of both taken near Oxford in illustration of the paper. Mr. Collins also sent for exhibition the beetles, *Apion astragali*, *A. sanguineum* P., *A. pustulatus*, and *Lebia chlorocephala*, as well as the Tortrix *Stigmonota pallifrontana*. — Mr. W. Mansbridge read a paper entitled, "Notes on a melanic race of *Agrotis ashworthii*," and exhibited a long series of moths bred in 1905, in illustration of his remarks; a discussion ensued, and, in further illustration, Mr. F. N. Pierce exhibited *A. candelarum* together with microscopic preparations of the genitalia of both insects, and Dr. Bell showed the preserved larva of *A. ashworthii*. Mr. Mansbridge discussed the evidence for and against the view that *ashworthii* and *candelarum* are the same species, and suggested the name *substriata* to distinguish the new form. The opinion of the meeting was to the effect that more evidence of identity was required, especially as regards early stages and structural detail of *candelarum*. Other exhibitors were Mr. W. A. Tyerman, a box of Lepidoptera including *Pygara pigra* from Ireland, *Eupithecia isogrammaria* and *Plusia festuca* from Lathone; *Noctua stigmatica* and *N. glareosa*; one of the latter a very rosy specimen, from N. Wales; *Acronycta ieporina* var. *melanocephala*, *Notodonta dromedarius* and *Pheosia dictaeoides* from Kirby, Lancashire. — Mr. R. Wilding, specimens of the coleopteron *Amara anthobia* from the Liverpool district. — Mr. E. J. B. Sopp, the scarce cockroach *Epilampra burmeister*, taken in the Manchester Docks, and identified by Mr. R. Shelford; *Panchlora virescens* from the Manchester Docks, Hoylake, and Warrington; *Aceridium ægypticum* from Birkdale; Mr. Copp also showed, on behalf of Mr. W. J. Lucas, the scarce *Stenobothrus elegans* from the New Forest, and, on behalf of Mr. W. E. Sharp, a nymph of the cockroach *Periplaneta australasica* from Brockenhurst. — H. R. SWEETING and WILLIAM MANSBRIDGE, Hon. Secs.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 15th, 1906.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. G. T. Fountain showed living larvæ and imagines of *Hadena unanimitis*, Tr., found on the canal bank at Marston Green and also at Earlswood, at both of which places they were abundant.—Mr. E. C. Rossiter remarked that he had recently come across two broods of *Smerinthus populi*, L., one of which occurred on common poplar, and the whole brood was of the dark variety of the larva, and the other brood was upon an aspen with whitish under sides to its leaves, and all the larvæ belonged to the light form. Mr. S. H. Kenrick said that he had found both forms together on the common poplar.—Mr. S. H. Kenrick showed some Lepidoptera taken on the Cotswolds during a visit at the last Bank holiday, including *Lycæna corydon*, Poda, *Drepana cultraria*, F., *Boarmia abietaria*, Hb., and *Psamatia (Botys) hyalinialis*, Hb. He also showed a number of *Lycænidæ* from Java and the Malay Archipelago.—Mr. G. T. Bethune-Baker showed various Lepidoptera, from Devonshire, taken in July. While there, he had very carefully observed *Satyrus semele* ovipositing, with the result that he detected that the eggs were never laid on fresh green grass stems, but near the top of the stump of grass of the previous season.—Mr. Simkins, various Lepidoptera, including a fine

series of *Gastropacha quercifolia*, L., bred from Surrey ova.—Mr. W. Harrison, *Cerura furcula*, Cl., bred from larvæ obtained near Sandwell Park.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Eighteenth Annual Report of the Delegates of the University Museum
(for 1905). 90 pp.

AMONG the other Reports contained in this volume is that of the Hope Professor of Zoology, Edward B. Poulton, D.Sc., M.A., F.R.S. From this we gather that the number of specimens of all Orders comprised in the Insect Collection is nearly 500,000. From a census taken by Commander J. J. Walker in 1904, Lepidoptera exhibited a total of 112,149, and Coleoptera 194,434; in 1905 he cast the number of insects in the other Orders at 134,075. It will be seen then that the Hope Department of the Oxford University Museum possesses an exceedingly large amount of entomological material, and it is evident that during the year 1905 the Professor and his staff have made very considerable progress in the work of preparing, cataloguing, and arranging this material so as to render it available for study. Besides much other important work that has been accomplished, or in hand, is the revision and arrangement of the Orthoptera by Mr. R. Shelford, who has completed the Blattidæ, and is now dealing with the other groups. Mr. Hamilton H. Druce has named the Lycænidæ, and the arrangement of the butterflies, as a whole, is nearly finished, the Papilioninæ and Hesperidæ only awaiting attention. As the Professor points out, however, "while one part is being arranged the others are rapidly growing, so that a certain amount of adjustment and re-arrangement will always be necessary."

*Melanism in Yorkshire Lepidoptera.** By G. T. PORRITT, F.Z.S.

MELANISM in Lepidoptera is a subject upon which much has been said and written, and many theories have been put forward as to the how and wherefore; but, as Mr. Porritt most justly remarked, "we really know very little about it." He had no definite theory of his own to advance, but he detailed a large amount of information concerning a great number of species, which in Yorkshire, and parts of Lancashire, are melanic, or exhibit a tendency to become so. Referring to var. *doubledayaria*, the black form of *Amphidasys betularia*, he said that in the South-west Riding this had become the dominant form of the species, and in the same area the typical form was now quite rare. "It is most curious, too, that in this species the black form appears to have developed suddenly, *i. e.*, it was not a gradual darkening, as no intermediates were noticed in a wild state."

* Paper read before the Zoological Section, and printed in the Report of the British Association for the Advancement of Science, Section D. York 1906.

Besides the species just adverted to, there are now in Yorkshire at least thirty others "in which melanism has become so strongly developed that in various districts—chiefly in the south-west—black or nearly black specimens of species, which in other districts are pale, are now regularly obtained." As regards eight or nine of these melanism is not of recent development, but in the case of the remainder "dark specimens have largely increased in numbers during the collecting experience of our present-day lepidopterists."

In the matter of hereditary transmission, Mr. Porritt gives some interesting illustrations. In 1904 he reared nine moths from a few eggs deposited by a black female *Odontopera bidentata*. Six of these were black like the female parent, and the other three of the ordinary form. "From the black moths in the following year, 1905," he states, "I reared a very large brood, about 75 per cent. of which were black; and from these again this year [1906] I bred a considerable number, of which the percentage of black was still greater."

Larentia multistrigaria is stated to be fast becoming entirely melanic in certain districts in Yorkshire, and it has been found by experiment that three generations reared in captivity have almost entirely eliminated the typical form of this species; among seventy specimens reared in the spring of 1906 there were only five or six pale ones.

Again, a male and a female of the largely black variety of *Abraxas grossulariata*, known as ab. *varleyata*, were reared from collected larvæ. These paired, ova were obtained, and from them a large brood of the moth was reared, all of the parent form, i.e. *varleyata*, and in no instance was any tendency shown of a return to the ordinary or any other form of the species. In the few localities known to yield ab. *varleyata*, specimens of the variety "reared by collectors only average about three for every thousand larvæ"; thus the chances of the sexes of the variety pairing in a wild state are exceedingly slender.

Mr. Porritt also points out that, although melanism affects certain species in South-west Yorkshire, other species occurring in the same area, and of which there are melanic forms in other parts of Britain, are in the district he deals with either normal or exhibit a tendency to leucochroism. In this connection he instances *Cidaria suffumata*, among other species. Of *C. suffumata*, the dark form *piceata*, which is common in Scotland, and also occurs in North Yorkshire, is scarcely known at all to the collectors in the melanic area of South-west Yorkshire. The species as it occurs there would seem to be becoming paler and generally modified in the direction of the variety, with pale clear ground and dark band, known as the "Dover form."

There is very much more in this exceedingly interesting paper to which we should like to refer, but our readers no doubt will make a point of perusing it themselves. They will find it much to their advantage to do so.

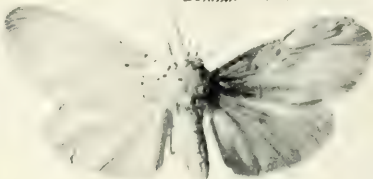
HYPSA ... *subretracta* ... nat size.



SUBRETRACTA ♂
COLL. MIHI



4
BAUMANNIANA ♂
DURAN MUSEUM



CONSPICUA ♀
COLL. MIHI
5



SUBRETRACTA ♀
COLL. MIHI
2



CONSPICUA ♀
COLL. MIHI
6



NEAR BAUMANNIANA ♂
COLL. MIHI
3



CATERPILLAR
FULL GROWN

Dr. J. H. ...
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ARE *HYPSA BAUMANNIANA* AND *H. CONSPICUA* VARIETIES OF *H. SUBRETRACTA*?

BY H. VON FELSER BERENSBURG.

(Office of the Government Entomologist, Pietermaritzburg, Natal.)

(PLATE I.)

DURING the summer of 1903 I found a number of caterpillars, then quite unknown to me, feeding upon the leaves of a cultivated fig-tree in my garden in Pietermaritzburg. I collected them all—a batch of about twenty—from the one tree, and at the time had no doubt in my mind that not only were all the caterpillars identical, but also, from their even size, of the one brood. There were many other fig-trees growing in the garden close by, but there were no caterpillars on these trees, neither then nor later in the season.

Being then in the service of the Railway Construction Department and frequently away from home, I was unable to make any notes upon the larval stage, which was seen through by my wife, who fed the insects daily upon fresh fig-leaves.

The adults emerged satisfactorily and evenly, the majority being typical *Hypsa subretracta*. There were, however, two well-defined varieties, represented by a male insect and two similar females.

Quite recently, in revising my collection of moths, I found in the Durban Museum the genus represented by three species, *H. subretracta* Wlk., *M. conspicua* Swinh., and *H. baumanniana* Karsch., the determinations having been made by Sir. G. F. Hampson, from Natal specimens sent to him by Mr. Quekett. Concerning these I may say that *H. conspicua* is identical with my variety of *H. subretracta* represented by two females, whilst *H. baumanniana* is almost, though not quite, similar to my unique variety (a male).*

* The two specimens of *baumanniana* in the Durban Museum are males, and both specimens of *conspicua* are females, analogous to the specimens in my collection. In these two cases the males incline to the darker

It therefore appears to me that *conspicua* and *baumanniana* are only varieties of *subretracta*. All the circumstances point to this conclusion, unless one is to concede the possibility of two eggs of *conspicua* and one of *baumanniana* having been laid amongst a batch of *subretracta*.

This note is not, however, written with the object of demolishing *baumanniana* and *conspicua*, but rather to draw attention to the facts which have come under my observation, and for the guidance of others who may be able to rear the species. This summer an endeavour will be made to clear the matter up, and a perfectly satisfactory conclusion arrived at.

EXPLANATION TO PLATE.

PLATE I.—Figs. 1 and 2, *Hypsa subretracta*, Wlk.; collection mihi. Fig. 3, *Hypsa* near *baumanniana*; collection mihi. The outer angle of the hind wings shows already the black margin as in a true *baumanniana*, but not so sharply defined, and more suffused. Fig. 4, *Hypsa baumanniana*, Karsch, from Durban Museum, which was identified by Sir G. F. Hampson, the outer margin of the hind wings being black, and sharply defined. Figs. 5 and 6, *Hypsa conspicua*, Swinh.; collection mihi. Fig. 7, Caterpillar of *Hypsa subretracta*, a blown specimen from the Durban Museum. Figs. 1, 2, 3, 5, and 6 are all of moths reared from the same batch of caterpillars.

[The left wing of Fig. 2 is rather light, and the right wing of Fig. 5 slightly too dark, being due to the effect of the sun, when the photos were taken.]

LIFE-HISTORY OF *THECLA PRUNI*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

ON June 23rd, 1904, I received from the late Mr. F. G. Cannon two females of *Thecla pruni*, taken by him the previous day in Northamptonshire. I at once placed them on a small plum-tree. In a week's time I found a few eggs were deposited on the smaller branches at the base of the forks. These exactly resembled little brown buds; they are laid singly, and from one to three on the same fork, but no doubt in a state of nature

variety or *baumanniana*, and the females to the yellow one or *conspicua*. It is noticeable that the females of the typical specimen or *subretracta* are much paler and less sharply marked on the under side of the wings than the typical males. In *subretracta* the black on the under side of the fore wings is less developed than in *baumanniana*, but much more than in *conspicua*, which has only a black transversal blotch at the end of the discoidal cell. One of my *conspicua* has no black at all on the under side, but is entirely yellow. On the upper side the small black dots near the base of the fore wings are very indistinct in this specimen. I send at the same time photographs taken from two typical *subretracta*, one specimen near *baumanniana* and two *conspicua* bred by myself; one *baumanniana* (named by Sir G. F. Hampson), and a caterpillar borrowed from the Durban Museum to demonstrate the variation.

(i. e., not confined to one tree or rather bush of blackthorn upon which the eggs are deposited in a wild state) only a single egg is laid on the same fork, or even branch, by the same parent.

The egg is of a compressed spherical form, $\frac{1}{32}$ of an inch in width, and $\frac{1}{70}$ in. high. The micropyle is sunken and finely pitted. The entire surface is covered with raised irregular reticulations forming a cellular pattern surrounding the micropyle, increasing in size over the rest of the surface into a network pattern, chiefly in the form of hexagons; at the juncture of each mesh is a raised point with a clefted knobbed apex. The spaces between the meshes are granular. The ground colour is pale buff, the reticulations rust-brown, and the points dark brown. During the winter it gradually becomes paler in colour, being in mid-winter a light greyish ochreous, and the points black at the extremities, appearing to the naked eye of a general light grey-brown. They remain unchanged until hatching about the end of March, being nine months in the egg state.

On March 26th and 27th, 1905, the eggs hatched. The larva eats away the central portion of the crown of the egg, leaving a comparatively large hole, and emerges. Directly after emerging, it measures $\frac{1}{20}$ of an inch long, of the usual onisciform shape. The third to ninth segments are humped dorsally, the first and last segments somewhat flattened, and each with a shining black disc. The head is also shining black, and bears a few very tiny bristles. There is a central dorsal furrow and a row of hairs running along each side composed of two hairs on each segment, both curving backwards, the anterior one being twice the length of the other; they have black shining pedestal-like bases. Below these is a minute subdorsal hair, almost touching a double black shining wart. The spiracles are large and shining black. Along the lateral subspiracular region on each segment is a cluster of four hairs of different lengths, each having a shining black bulbous base, and shorter hairs are scattered over the ventral surface and claspers. The whole colouring is lilac-brown, becoming ochreous on the ventral surface. The entire surface is granular, and covered with minute shining points.

Just previous to the first moult it measures only $\frac{1}{14}$ of an inch long. During the first stage it exactly resembles the outer sheath of the bud which remains attached to the base of the young shoot; these are yellow, with rust-brown tips. The larva is of similar coloration, having the fifth, sixth, and seventh segments light ochreous yellow; the remaining segments at each end reddish brown. First moult occurred on April 13th, the first stage occupying eighteen days.

After first moult—twenty-five days old—it measures $\frac{1}{8}$ of an inch long. The first and last segments are rather compressed. The back is humped and considerably elevated, with a central dorsal longitudinal furrow. Each hump has a series of sharply

pointed serrated bristles with pedestal bases; these form a longitudinal fringe along each side of the furrow. The sides are concaved with a prominent lateral ridge, also furnished with a fringe of bristles similar to those on the dorsal surface, and immediately below is another series of long fine simple cream-coloured hairs; both series project laterally; the bristles are ochreous, with blackish tips. Scattered over the body are numerous short bristles and circular discs resembling spiracles. The head is pale ochreous and black. The fifth, sixth, and seventh segments are varied in colouring, with yellowish pale green and pink; the remaining segments are purplish rose. The ventral surface, claspers, and legs are greenish white.

Seven days after the second moult it measures $\frac{1}{4}$ in. long. In shape it is similar to the previous stage. The head is shining black, and while at rest is concealed under the projecting flattened anterior segment. The dorsal area, excepting the fifth, sixth, and seventh segments, is a deep rose colour, and a beautiful rich rose tint exists on the lateral ridge of the second, third, fourth, and fifth segments, becoming white on the sixth, seventh, and eighth segments, and rich rose on the last four segments, extending round the anal extremity. The central third of the body is a pale yellowish green with darker green oblique stripes. On the inner dorsal edge of the fifth, sixth, and seventh segments is a deep rose crescentic mark externally edged with whitish. The spiracles are pale amber-brown. The whole surface is densely sprinkled with minute spines. Along the dorsal and lateral ridges are clusters of much longer spines on each segment, excepting the eleventh. The whole of the ventral surface is of a greenish pearly white. It feeds deeply into the tender shoots of its food-plant. The third and last moult takes place during the last week of May.

After third moult—fully grown—it measures, when crawling, $\frac{5}{8}$ in. long. The head is pearly white, with slight greenish reflections, marked with pale olive in front. The mouth-parts are red-brown and white; eye-spots black. The first segment is compressed and rounded, completely overlapping the head, and indented in the centre, where there is a glazed whitish disc. The body is much elevated dorsally. The second, third, and fourth segments are not humped, but merely sunken in the centre, forming very slight dorsal ridges. The fifth, sixth, seventh, eighth, and ninth segments inclusive are strongly humped, each segment rising to a point on the dorsal ridge, leaving a deep central furrow; these points have each a sub-marginal crescentic rich deep purple-rose mark on the inner side, and externally outlined with white on the fifth, sixth, and seventh segments. The anal segment has a longitudinal dorsal mark of the same rose colour and a paler rose tint blended round the lateral edge. The ground colour is a clear green, with four

oblique pale yellow-green stripes and a longitudinal lateral line of the same colour. The ventral surface is whitish green, including the legs and claspers. The whole surface above the lateral ridge is densely sprinkled with minute amber-brown spines, each with a fluted pedestal base. They are sparsely serrated and sharply pointed and longest on the dorsal area. On the tenth segment is a much longer pair, each in the middle on the dorsal ridge; these are duplicated on the eleventh segment by a much shorter pair. The spiracles are prominent, of a bright amber-brown. On each segment are a number of tiny greenish glassy discs. The larva in this stage continues feeding almost unceasingly, for several hours' duration I could not detect it stopping. The last stage occupies about ten days.

One pupated on June 7th.

The pupa is short, stout, and humped. It measures $\frac{3}{8}$ in. long, and $\frac{3}{16}$ in. in diameter from third abdominal segment to the ventral surface. Dorsal view: Head slightly notched in front, angular at base of wings, concave at the waist, swollen at the middle of abdomen, and abruptly attenuated to the anal segment. Lateral view: Head pointed in front; thorax swollen and rounded, sunken at the waist; abdomen suddenly rising to third segment, where it is strongly humped, then curves to anal segment; each segment has a subdorsal point, decreasing in size from the third segment; between these and the spiracles are two punctures on each segment; the under surface forms a straight line. Colour: Directly after pupation it is pale greenish, with paler thoracic markings; it gradually darkens, and in about forty-eight hours assumes its normal colouring, which is as follows. The ground colour of the dorsal surface is a clear brown-black, having a rather varnished appearance, becoming ochreous brown by the spiracles and over the wings; it is variegated with white on the prothorax; hind portion of mesothorax and whole of the metathorax, also each side of the first abdominal segment, and speckled with white on the remaining segments bordering the wings; the spiracles are prominent, black and shining. The whole of the dorsal surface is sprinkled with tiny amber-coloured hairs. The wings and ventral surface, excepting the abdomen, are smooth. It is attached to the stem of its food-plant by a silken girdle round the waist, and by the cremastral hooks, to a silken pad. In general form, and especially the colouring, it exactly resembles a bird's excrement, which it undoubtedly mimics.

The pupal state occupies about eighteen days. The one described emerged on June 25th, which is about the normal time for the appearance of this butterfly.

It will be noticed that the larva of *T. pruni*, like others of this genus, moults only three times. I have detected these larvæ in the act of devouring each other. In one instance a

larva in the third stage ate through the base of a leaf upon which a younger specimen was fixed for moulting, and the larger one I found was devouring it greedily. I at once moved it to an adjoining branch, but, curiously enough, it crawled down the branch and up the one from which I removed it, and again attacked the moulting larva in precisely the same manner through the hole in the leaf, and renewed its meal of the identical part of its victim.

DRAGONFLY SEASONS OF 1905 AND 1906.

By W. J. LUCAS, B.A., F.E.S.

IN 1905 there was little new to relate with regard to the British dragonfly fauna. The first specimens observed by me were *Pyrrosoma nymphula*, on May 7th, and *Libellula quadrimaculata* on May 10th, both at or near the Black Pond in the fir-woods near Oxshott, Surrey. On May 11th Mr. F. Balfour Browne sent me three living specimens of *Agrion armatum*, one male and two females, from the Norfolk Broads. He considered that the "hatch" was rather earlier than in 1904. All three were in somewhat teneral condition. On May 28th *Cordulia aenea* was first seen for certain at the Black Pond, and at the same time and place *Enallagma cyathigerum* was observed. On May 31st the only species noticed on Bookham Common was *Agrion puella*.

In the New Forest, from June 9th till June 13th, *Orthetrum cærulescens* and *Calopteryx virgo* were numerous, the former in teneral condition, and the latter usually so. *Platynemis pennipes* and *Agrion mercuriale* were found, but *Ischnura pumilio* did not reward my search—apparently it was not out. *P. nymphula* was plentiful, and one var. *æneatum* was met with. Though special quest was made for *Gomphus vulgatissimus*, a single female only was obtained.

On July 2nd *L. quadrimaculata* was in fair numbers at the Black Pond and was still emerging, a few *Anax imperator* were seen, *Pyrrosoma tenellum* was out though some individuals were in teneral condition. On July 17th *Sympetrum scoticum* and *E. cyathigerum* were taken on Arbrook Common, in the same district.

In the New Forest, during August, dragonflies were, of course, numerous. *A. mercuriale* and *I. pumilio* were taken, though no specimens of the var. *aurantiacum* of the latter were seen. *Æschna juncea* was taken on August 6th, and *P. nymphula* was still on the wing; on the same day an *A. puella* was found caught in the web of a rather small spider, which commenced binding it up, and perhaps may have stung it, for it died shortly afterwards in the collecting-box in which both were

placed. The next morning the spider was found upon the dragonfly, but whether feeding upon it or not I cannot say. On August 21st, the weather not being suitable for dragonflies, a male *Cordulegaster annulatus* was found at rest on a bush with its wings spread, the costal margins of corresponding pairs being in straight lines. Its legs were bunched up, all the tarsi, apparently, being approximated. For some time it did not resent being touched as it hung; later it began to quiver its wings, though with what object was not clear, and being handled again it suddenly took to flight.

At the Black Pond, on September 12th, *Sympetrum striolatum* and *S. scoticum* were numerous and *E. cyathigerum* was not scarce. *Æschnas* were fairly plentiful, and one male each of *Æ. grandis*, *Æ. cyanea*, and *Æ. mixta* were taken, while one that settled on a tree-trunk, judging by its yellowish costa, must have been *Æ. juncea*. The last dragonfly seen was at the same place on November 12th. It was on the wing, and by its size and appearance could only have been *S. striolatum*; but, though it flew near me, it gave me no opportunity of making a capture.

Mr. K. J. Morton was good enough to give me a pair of *Somatochlora arctica*, which he took at Black Wood, Rannoch, on July 19th, and a male *Æschna cærulea* with colour nicely preserved, taken at Learan, Rannoch, on July 14th.

In 1906 the season for me opened even later than in 1905. *P. nymphula* was first seen at the Black Pond on May 13th, and an *L. quadrimaculata* was probably sighted from a little distance the same day. In a fish-globe at home, about May 25th, a nymph of *P. nymphula* (captured in the New Forest), which had appeared ready to emerge for some time, crawled up a stick out of the water about 7 a.m. Having partly emerged, it remained in its "resting" position for a longer time than I have been accustomed to expect for Agrioninæ. The rest being over, it did not suddenly complete its emergence, but raised its legs gradually. Then it held the stick with fore and mid-legs, and the head of the nymph-skin with the hind ones, before drawing out the remainder of the abdomen. A few minutes after 8 a.m. the wings had attained about their full length. The specimen was a female.

In the New Forest, from June 2nd till June 5th, with the exception of *P. nymphula*, few dragonflies were noticed. *C. virgo* was in teneral condition; the wings looked dark brown. *G. vulgarissimus* and *I. pumilio* were not found. From nymphs dredged in April near Whitley Ridge Mr. G. T. Lyle bred *L. quadrimaculata* and secured nice photographs of the emergence.

On June 10th, at the Black Pond, dragonflies were few and appeared to be late, but on the evening of June 19th they seemed to be numerous there, and *A. imperator* was seen on the wing about 6.30 p.m. *P. tenellum* was flying at the pond on July 1st.

Mr. H. M. Edelsten was kind enough to give me specimens

of *Orthetrum cancellatum*, captured in July at the Norfolk Broads, where, also, he took *Æ. isosceles*.

In the latter part of the summer dragonflies were, as usual, very numerous in the New Forest. On July 30th a male *C. annulatus* was seen to settle on a bush quite close at hand. It hung with the costal margins of the wings at right angles to the body and the wings, therefore, partly overlapping. The specimen was feeding on a worker of the wasp, *Vespa vulgaris*, and was in consequence captured with its prey. This species was noticed on the wing at 7.25 a.m. on August 4th and at 7.18 a.m. on August 23rd. It was very common on September 1st. *I. pumilio* was found on August 11th in a new locality in the Forest, some two or three miles from its previously known haunts; while, on August 7th, *A. mercuriale* was discovered in a part of the Forest quite distant from its other known localities, which now number some five or six. On September 1st a few *C. virgo* were still about, chiefly females. *P. tenellum* var. *æneatum* was taken connected *per collum* with a male, which appears never to be trimorphic like the female, or even dimorphic. Master J. W. Edwards shewed me a specimen of *Æ. cyanea* that he had captured quite early in August in the neighbourhood of the Itchin at Eastleigh.

On September 24th Mr. R. Adkin sent me three specimens of *S. striolatum* from Eastbourne, and said: "It has become very common here during the past day or two. I have noticed it here each autumn, but this year it seems to be unusually abundant all of a sudden." On October 14th this species and *S. scoticum* were very lively at the Black Pond, and an *Æschna* was seen in the district. About the 19th of the same month, in Kingston-on-Thames, a female *S. striolatum* was seen to settle with a fly in its clutches—apparently a house-fly or a small blowfly. I carefully approached and caught the dragonfly in my hand, but she let go the fly, which was not so badly damaged as to prevent its flying sharply away. My last dragonfly of the season—no doubt an individual of the species last mentioned—was seen near Byfleet, in Surrey, on November 2nd.

In the previous volume of the 'Entomologist,' pages 281-2, Messrs. H. and F. Campion have given a full account of their interesting captures of *Sympetrum flaveolum* and *S. vulgatum* in Epping Forest.

In 1906, I understand from Mr. F. Balfour Browne, *A. armatum* and *Æ. isosceles* were common at the Norfolk Broads. The latter, he says, is quite common every season, and there are places where it is the commonest species. It disappears somewhat early in the season, and is replaced by *Æ. grandis*.

Mr. R. J. Wallis has secured specimens of the dragonflies that occurred during 1906 in the gardens of the Royal Horticultural Society at Wisley, in Surrey. I find that they consist

of *Æ. cyanea* (one male), *L. quadrimaculata*, *S. scoticum*, *Calopteryx splendens*, *P. nymphula*, *A. puella*, and *Ischnura elegans*.

Mr. K. J. Morton tells me that in July, 20th to 30th, at Emyvale, co. Monaghan, dragonflies were numerous, the species being *S. striolatum*, *L. quadrimaculata*, *Æ. juncea*, *Æ. grandis*, *C. splendens*, *Lestes sponsa*, *P. nymphula*, *I. elegans*, *Agrion pulchellum*, and *E. cyathigerum*.

Kingston-on-Thames: January, 1907.

NEW ABERRATIONS OF *ASTHENA TESTACEATA*, DON. (*SYLVATA*, HB.).

BY EUSTACE R. BANKES, M.A., F.E.S.

I AM indebted to my friend, Mr. Edward Goodwin, for the opportunity of examining a few most interesting and beautiful aberrations, taken by him in a very restricted area in Mid-Kent during 1903-4-5, of the species generally known in this country as *Asthena sylvata*. Authors are by no means agreed as to its correct generic or specific names, but the question of nomenclature is outside my present purpose. These aberrant forms, which occur alike in both sexes, and appear to be undescribed, fall into two main groups, which may be characterized as follows:—

1. *Ab. intermedia*, n. ab.—Both fore and hind wings have the whitish ground colour, which still prevails, more thickly and generally dusted with dusky brown, especially along the costa of the fore wing, and have the transverse dusky brown lines more strongly pronounced, than in the typical form.

2. *Ab. goodwini*, n. ab.—All the wings are so generally and thickly dusted with dusky brown that the whitish ground colour is largely obscured by it, especially towards the costa of the fore wings; this, however, tends to be less so along the actual termen, and near the tornus, of both fore and hind wings, than elsewhere. The tawny fasciæ on both the fore and hind wings are, however, still quite visible.

The individuals in question, though all are referable either to *ab. intermedia* or to *ab. goodwini*, vary considerably *inter se*, and practically show every gradation *between* the typical form and complete melanism. In the darkest example of *ab. goodwini* the normally pale ground colour has almost disappeared, and the head, collar, thorax with tegulæ, and abdomen are, like the wings, dusky brown above, though this last is prettily barred with white, and has an ochreous anal tuft. The sight of this specimen at once suggests the idea that before long we shall hear of an extreme aberration in which the whitish ground colour has entirely disappeared, and this is rendered all the

more probable by the fact that Mr. Goodwin—after whom I have the pleasure of naming the most striking of the two forms under notice—has taken at least two individuals darker than any that he could submit to me; these, however, being females, were kept for ova (which alas! proved infertile), and consequently were useless for the cabinet. I also learn from him that the insect is not common in the locality that produces these remarkable aberrations, and that only about 10 per cent.—or possibly 15 per cent.—of the specimens met with there are, to a greater or less extent, darker than the type.

These dusky *A. testacea* furnish additional proof of the unexpected wealth of Kent in melanic forms of Lepidoptera, to which I called attention in Ent. Mo. Mag. ser. 2, xvi. 90 (1905).

Norden, Corfe Castle : January 19th, 1907.

A NEW MOSQUITO FROM INDIA.

By S. ROTHWELL.

Neocellia intermedia, n. sp.

Head deep brown clothed with grey scales in front, and a grey projecting tuft. Palpi brown, with two broad apical, and two narrow basal white bands. Thorax slaty-grey in the middle, deep brown on each side, with pale scales. Abdomen brown, with pale creamy and ochreous scales and golden hairs. Legs brown, speckled and banded with cream colour, tarsal banding very minute on the brown hind legs. Wings with four large costal spots, the two apical ones spread evenly on to the first long vein; the second has two small spots under it on the first long vein, the second has two small spots under it on the first vein and the third one.

♀. Head densely clothed with upright white forked scales in front, black ones behind, a few white curved ones in front with a long irregular tuft of hair-like ones projecting forwards; antennæ deep brown, with numerous small white scales and hairs on the basal segments; palpi brown, with two broad bands towards the apex, and two narrow ones on the basal half, the two broad ones separated by a narrow black ring; proboscis black, pale at the apex. Thorax slaty-grey in the middle, deep brown at the sides, clothed with broad curved, rather flattened creamy scales, pale golden chætæ over the roots of wing; scutellum slaty-grey, paler at the sides, with similar scales to the mesothorax and brown border bristles; metanotum deep brown; pleuræ brown, with grey sheen and some flat creamy scales. Abdomen brown, with narrow, curved, creamy scales becoming densest on the apical segment, and with pale hairs. Legs brown; the femora and tibiæ with yellow spots; the fore metatarsi with three yellow spots, one apical; the first and second tarsals with

minute apical yellow bands; the mid-legs much the same, the hind with minute yellow apical bands to all the tarsi but the last. Wings with four large black costal spots and one or more smaller basal ones, the second and third about equal, the first smaller, the fourth rather larger than the first; the first and second spread evenly over the first long vein, the third spreads evenly on to the subcostal, and only partly on to the first long vein at its apical end on two small spots, fourth evenly on the first vein, the small basal one confined to the costa; most of the vein yellow-scaled; a dark spot on the upper branch of the first fork cell just under the apical costal spot; a small dusky patch on each side of the cross-vein; the third with an apical spot and another on each side of the cross-vein, two on the upper and two on the lower branch of the second fork-cell, and many dark scales on the stem; the upper branch of the fifth has a small apical spot and small ones on each side of the cross-vein, and one on the apex of lower branch; sixth with three black spots. Fringe with pale areas, at the ends of all the veins except the sixth. First submarginal cell longer and narrower than the second posterior cell, their bases nearly level; the first fork-cell is contracted at the apex, its stem as long as the cell, stem of the second longer than the cell; supernumerary cross-vein in front of the mid, and the mid further in front of the posterior cross-vein. Length, 5-5.5 mm.

♂. Head brown, with white upright forked scales in front, darker ones behind and at sides; a tuft of long white scales projecting forward between the eyes. Proboscis long and thin, dark brown in colour, with a pale apex. Palpi with two distal segments swollen or club-shaped; palp mottled with grey and brown scales, which more or less form into bands. Last two segments grey, with a thin brown band in the middle. Antennæ plumose, with last two segments long and pilose, plumes light brown; a few scales present on the basal segments. Thorax ashy-brown, with grey broad-curved scales; sides dark brown; scutellum slaty-grey, paler at the sides, with broad-curved scales and dark brown bristles. Metanotum deep brown. Abdomen light shining brown, with darker apical borders to segment. Narrow curved scales scattered over the abdomen, also golden hairs. Genitalia with claspers curved apically, a longish median process between the basal lobes. Legs mottled with yellow and brown scales; pale apical bands to tibiae and to the first three tarsals. Wings with three large black costal spots and two smaller ones; the second and fourth about equal in size; first very small; the third the largest. Other wing-spotting as follows: a dark spot on the upper branch of first fork-cell; basal half of lower branch dark; small spot on the stem of the cell; on the third long vein is an apical spot, and one on each side of cross-vein, two on the upper and two on the lower branch of second fork-cell, with stem of cell mostly dark; upper branch of fifth vein with two spots, one each side of the cross-vein; two dark spots on sixth long vein. Fringe with pale areas at the ends of all veins. First submarginal cell longer and narrower than second posterior cell, its stem slightly longer than the cell; the apex of cell is slightly contracted; stem of second posterior cell nearly twice the length of cell. Posterior cross-vein twice its own length from mid cross-vein; supernumerary in front of mid. Length, 5.5 mm.

Habitat.—Deesa.

Observations.—Described from three females and a single male sent to Prof. F. V. Theobald by Major C. G. Nurse. The male specimen was not in a very good state, some of the legs being absent. The three females show some variation in wing markings, especially in the spots under the large costal spot, and in the size of the wings. The first submarginal cell is markedly contracted at the apex.

COLEOPHORA TRICOLOR, WLSM., AT SEAFORD, SUSSEX.

By PHILIP J. BARRAUD, F.E.S.

I SHOULD like to record the capture of two specimens of the above-named moth at Seaford on July 9th, 1905. These were taken by my friend Mr. T. F. Furnival, who is now in South Africa, and who gave me his collection of Lepidoptera before leaving this country. The specimens have been kindly identified for me recently by Mr. Eustace R. Banks.

Bushey Heath, Herts: January 7th, 1907.

NOTE ON COLEOPHORA TRICOLOR, WLSM.

By EUSTACE R. BANKES, M.A., F.E.S

THE capture of *Coleophora tricolor* in Sussex is of the greatest interest, for hitherto there has been no evidence of its occurrence outside the county of Norfolk, where it was taken, amongst mixed rough herbage on the Breck sands, by Lord Walsingham [who described it in Ent. Mo. Mag. ser. 2, x. 201 (1899)], and was subsequently met with by Mr. E. A. Atmore. *Tricolor* could hardly be confused with any known British species except *lixella*, but this it resembles so remarkably closely that it can only be satisfactorily separated therefrom by certain antennal differences, the most obvious of which is that the pale antennæ have the terminal two-thirds completely ringed with brownish-grey, whereas in *lixella* the corresponding portion, although dark-spotted on the under side, never shows dark annulations.

I am much indebted to my friend, Mr. Philip J. Barraud, for most kindly adding one of the Seaford specimens to my collection, and earnestly hope that we may, in the near future, hear of the discovery of the larva and food-plant of *C. tricolor*, for no *Coleophora* larva ought to be able for long to defy detection.

Norden, Corfe Castle: January 12th, 1907.

CURRENT NOTES.

BY G. W. KIRKALDY.

(Continued from vol. xxxix., p. 287.)

58. DISTANT, W. L.: "The Fauna of British India. . . . Rhynchota." Vol. i., pp. i.-xxxviii. and 1-438, text-figs. 1-249 (— 1902); vol. ii., pp. i.-x. and 1-242, text-figs. 1-167 (Dec., 1903), and pp. i.-iv., xi.-xvii. and 243-503, text-figs. 168-319 (— 1904); vol. iii., pp. i.-xiv. and 1-503, text-figs. 1-266 (— 1906) [Hemiptera].
59. BROWN, R. E.: "Strychnine as Food of *Aræocerus fascicularis*, De Geer." J. N. York E. S. xiv. 116 (Sept., 1906). [Coleoptera].
60. STRETCH, R. H.: "Heterocera americana." *Op. cit.*, 117-25, plates ii.-xii. (Sept., 1906). [Lepidoptera].
61. CHILTON, C.: "Note on the Occurrence in New Zealand of Dipterous Insects belonging to the Family Blepharoceridæ." T. N. Zealand Inst. xxxviii. 277-8, plate xlv., figs. 1-2 (June, 1906).
62. HUDSON, G. V.: "Notes on Insect Swarms on Mountain-Tops in New Zealand." *Op. cit.*, 334-6 (June, 1906).
63. CROMBRUGGHE DE PICQUENDAELE (Baron de): "Catalogue Raisonné des Microlépidoptères de Belgique." Parts 1 and 2. Mém. Soc. Ent. Belg. xiii. 1-172 and xiv. 1-155 (1906). [Lepidoptera].
64. MAYER, P.: "Zoologischer Jahresbericht" for 1905: Arthropoda, pp. 1-71 (1906).
65. LUCAS, R.: "Bericht über die wissenschaftlichen Leistungen im Gebiete der Entomologie" for 1901, pp. 285-972 (1906!). [Lepidoptera, Hymenoptera].
66. SEIDLITZ, G.: Ditto for 1904. Pp. 1-360 (1906). [General and Coleoptera].
67. SCHROTTKY, C.: "Eine merkwürdige Monstrosität an *Carineta formosa*, Germ." Wien. Ent. Zeit. xxv. 261-2, figs. 1-2 (Aug. 15th, 1906). [Hemiptera].
68. KIRKALDY, G. W.: "List of the Genera of the Pagio-podous Hemiptera-Heteroptera, with their Type Species, from 1758 to 1904 (and also of the Aquatic and Semi-aquatic Trochalopoda)." Tr. Amer. Ent. Soc. xxxii. 117-56 [dated March-June, 1906, but actually published in August or September].
69. CHAPMAN, R. H.: "The Deserts of Nevada and the Death Valley." National [U.S.] Geographic Mag. xvii. 483-97, 1 map and 8 views (Sept., 1906).
70. "Map of the Philippine Islands" (in four colours, 23 in. by 36 in.), Supplement to ditto, xvi. (Aug., 1905).

71. "Map of the Region of the Panama Canal" (in five colours, 24 in. by 33 in.), Supplement to ditto (Oct., 1905).
72. PERDICARIS, I.: "Morocco, the Land of the Extreme West." *Op. cit.*, xvii. 117-57, 26 views (Mar., 1906).
73. SHIRAS, G.: "Photographing Wild Game with Flashlight and Camera." *Op. cit.*, 367-423, 74 views (July, 1906).
74. BAILEY, S. I.: "New Peruvian Route to the Plain of the Amazon." *Op. cit.*, 432-48, with coloured map of South America and 12 views (Aug., 1906).
75. MORGAN, T. H.: "An Alternative Interpretation of the Origin of Gynandromorphous Insects." *Science* (2) xxi. 632-5, 3 figs. (April 21st, 1905).
76. HEYMONS, R. and H.: "Die Entwicklungsgeschichte von *Machilis*." *Versl. Deutsch. Zool. Ges.* xv. 123-35, figs. 1-10 (1905).
77. THIENEMANN, A.: "Biologie der Trichopteren-Puppe." *Zool. Jahrb. Syst.* xxii. 489-574, plates 16-20 (1905).
78. BRUES, C. T.: "Notes on the Life History of the Stylopidae." *Biol. Bull. Woods Hole* viii. 290-5, figs. 1-2 (1905). [Coleoptera].
79. CARPENTER, F. W.: "The Reactions of the Pomace Fly (*Drosophila ampelophila*, Loew) to Light, Gravity, and Mechanical Stimulation." *Amer. Nat.* xxxix. 157-71, 1 fig. (1905). [Diptera].
80. HOLMES, S. J.: "The Reactions of *Ranatra* to Light" *J. Comp. Neurol. Granville* xv. 305-49, 6 figs. (1905). [Hemiptera].
81. MJÖBERG, E.: "Biologiska och morfologiska Studier öfver Faröns Insektfauna" *Ark. Zool. Stockholm* ii. No. 17, pp. 1-86 (sep.?), figs. 1-7 and map (1905).
82. GREEN, E. E.: "Millipede killed by Reduviid Bug." *Spol. Zeylan.* ii. 159 (1905). [Hemiptera].
83. KREIDL, A., and REGEN, J.: "Physiologische Untersuchungen über Thierstimmen. Stridulation von *Gryllus campestris*." *Sb. Ak. Wien* cxiv. pp. 57-81, 1 plate (1905). [Orthoptera].
84. RÖHLER, E.: "Beiträge zur Kenntniss der Sinnesorgane der Insekten." *Zool. Jahrb. Morph.* xxii. 225-88, plates 15-16 (1905). [Orthoptera, Diptera].
85. VOSS, F.: "Über den Thorax von *Gryllus domesticus*" Parts 2-4. *Zeit. Wiss. Zool.* lxxviii. 355-521 and 645-759, 3 plates and 31 figs. (1905). [Orthoptera].
86. HANCOCK, J. L.: "The Habits of the Striped Meadow Cricket (*Oecanthus fasciatus*, Fitch)." *Amer. Nat.* xxxix. 1-11, figs. 1-3 (1905). [Orthoptera].
87. MARCHAL, P.: "Observations biologiques sur un Parasite de la Galéruque de l'Orme, le *Tetrastichus xanthomelænae*, Rond." *B. S. E. France*, pp. 64-8 (1905). [Coleoptera].
88. WAGNER, W. VON: "Über die Genesis und die Entwicklung

der Geselligkeit im Thierreiche." C R. 6 Congr. Internat. Zool. 674-89 (1905). [Hymenoptera].

89. PETERSEN, W. : "Über die Bedeutung der Generationsorgane für die Entstehung der Arten." *Op. cit.*, 213-24 (1905). [Lepidoptera].

(To be continued.)

NOTES AND OBSERVATIONS.

THE MAZARINE BLUE (*NOMIADES SEMIARGUS*) IN WALES. — I write the "Mazarine Blue" advisedly, because the English names are the only abiding feature in the nomenclature of our British butterflies. In South's 'Butterflies of the British Isles' it is stated, page 178, that "probably the latest captures in Britain were the specimens taken in Glamorganshire in the years 1874-77." It may be of interest to record that in the latter year I received from a correspondent in Cardiff, whose name I have completely forgotten, a male specimen of this rare insect, in exchange for some duplicates in my possession. What those duplicates were I have no distinct recollection, but nothing in comparison with the specimen I received. My correspondent informed me that it and a few others had been taken by himself in the hill country close to Cardiff in that year or just previously. It was a male, in bad condition so far as the setting was concerned, and was without an abdomen. Alas! it has long since disappeared from my collection; but I well remember that the wings were of rather a bright blue with no purplish or violaceous tinge. I do not know whether the insect figured by Mr. South was an English specimen, but I think the purple tinge is rather too pronounced. It would, I feel sure, be of considerable interest if further notes regarding the last captures of this insect were put on record, and where the insects may be seen. It seems to me somewhat strange that such a widely distributed and common butterfly on the Continent should become extinct in the British Isles for no apparent cause.—(Lt.-Col.) N. MANDERS; R.A.M.C., Mauritius.

[The figures referred to are reproductions of coloured drawings, by Mr. Horace Knight, from old British specimens. In printing, the red stone is slightly over much in evidence.—ED.]

INSECT FAUNA OF DEVONSHIRE.—The Section Insecta, pp. 163-244, in 'A History of Devonshire,' a recent volume of "The Victoria History of the Counties of England" series, is a valuable addition to our knowledge of the distribution of insects in England. The lists, chiefly annotated, of the various Orders have been carefully prepared by well-known specialists, and are as follows:—Orthoptera, by George C. Bignell, F.E.S.; Neuroptera, by Charles A. Briggs, F.E.S.; Hymenoptera, by G. C. Bignell, F.E.S.; Coleoptera, by the Rev. Canon Fowler, M.A., D.Sc., F.L.S., &c.; Lepidoptera, by the late Charles G. Barrett, F.E.S.; Diptera, by Ernest E. Austen; Hemiptera, by G. C. Bignell, F.E.S. Mr. Bignell's articles on Gall Makers, and on Parasitic Hymenoptera are interesting and instructive. We must again express regret that the faunistic sections of these county histories are not published separately, at a popular price, so that they might become more readily accessible to the entomological public.

CAPTURES AND FIELD REPORTS.

LITHOSIA CANIOLA NOT IN HAMPSHIRE.—In the 'Entomologist' for December, 1906, I recorded the capture, at Bournemouth, of *L. caniola*. With the help, however, of a more experienced entomologist, further investigation satisfies me that my specimen is *L. stramineola*, and I am sorry that Hampshire cannot claim the former insect for its list. My friend was able to assure me that an insect which I took in my dining-room here, June 30th, 1906, is indeed an excellent specimen of *Eupithecia innotata*.—(Rev.) A. DAY; The Vicarage, Malvern Link.

LEUCANIA VITELLINA IN WEST CORNWALL.—Mr. W. A. Rollason, of Truro, asks if his capture of *L. vitellina* in September, 1906, is a record for the county of Cornwall. In reply, I may say that it is the first published, but I captured two specimens in South Devon, and one in West Cornwall, in the autumn of 1889. A record of these was sent to a periodical then only started a few months, but it was not inserted. I, however, received a letter, in which the writer stated that *L. vitellina* was not taken so far north as Britain. In the same autumn a specimen was taken at sugar in the Isle of Wight, and that capture was mentioned in most of the entomological magazines. I may add that I have six specimens of *L. vitellina* in my collection, all taken about three miles beyond Penzance, in an old orchard about three hundred yards from the sea. The late Mr. Baily also took one in the same orchard, but too late to be included in his list of Lepidoptera of West Cornwall.—WILLIAM DAWS; 39, Newwood Street, Mansfield, Notts.

PLUSIA MONETA IN NOTTINGHAMSHIRE.—I took a specimen of *P. moneta*, at light, on July 21st last.—F. J. RASELL; Weedon Road, Northampton, January 21st, 1907.

LEPIDOPTERA OF EAST SUTHERLAND.—The following is a list of species taken during 1906 (July excepted), within a ten mile radius of Golspie. On reference to Meyrick's 'Handbook' I find that many of the insects mentioned by me do not appear to be recorded north of Ross-shire, and others not even so far north as that county:—

Argynnis aglaja, singly. *A. euphrosyne*, sparingly. *Pyrameis cardui*, singly. *Satyrus semele*, common; resting on stones of old sea-beach, now some three hundred yards from present high-tide line. Slightly darker than the writer's English and Welsh specimens. *Epinephele ianira*, sparingly. *Cænonympha typhon*, sparingly, on heaths and on damp sides of lochs. *Thecla rubi* fairly common on heaths and mountain slopes. *Chrysophanus phleas*, sparingly. *Lycana alexis* (*icarus*), sparingly. *Pieris napi*, *P. rapi*, *P. brassicae*, fairly common. *Hepialus lupulinus*, *H. humuli*, common. *Phragmatobia fuliginosa*, *Spilosoma lubricipeda*, *S. menthastri* sparingly; larvæ fairly common on plantain. *Pæcilocampa populi*, singly in November, to light. *Lasiocampa quercus*, imago sparingly, larvæ commonly. *Rumia luteolata*, abundant. *Metrocampa margaritaria*, singly. *Ellopiopsis prosapia*, *Boarmia repandata*, sparingly. *Dasydia obfuscaria*, singly. *Ematurga atomaria*, common. *Bupalus piniarius*, male common, female sparingly. *Abrazas grossulariata*, *Lomaspiis marginata*, sparingly. *Oporabia dilutata*, common; all very pale specimens. *Larentia didymata*, the most abundant species. *L. multistriata*, sparingly. *L. cæsiata*, abundant.

flying from trunks of *Pinus sylvestris*. *L. olivata*, singly. *L. viridaria*, common. *Emmelesia aenitata*, singly. *Thera variata*, abundant, flying from trunks of *Pinus sylvestris*. *Ypsipetes sordidata*, singly. *Anticlea nigrofasciaria* (derivative), single specimen in newly emerged condition, June 9th. 1906. *Coremia munitata*, singly. *Cumtogramma bilineata*, *Cidaria corylata*, sparingly. *C. truncata*, fairly common; very variable specimens. *C. immanata*, fairly common. *C. siliceata*, singly. *C. testata*, fairly common. *C. fulvata*, abundant. *Eubolia limitata*, (mensuraria), sparingly on ragwort; much darker and richer colouring in fore wings than southern specimens. *Chesius spartiata*, single specimen to light. *Platypteryx falcataria*, sparingly; larvæ common. *Acronycta psi*, common; larvæ frequent on pear. *Leucania conigera*, *L. comma*, *L. impura*, *L. pallens*, all common, on ragwort. *Hydræcia micacea*, common on ragwort; very variable colours in fore wings. *Xylophasia rurea*, common, on ragwort. *X. monoglypha*, very common on ragwort. *Charæas graminis*, sparingly on heaths and ragwort; all specimens larger and darker than English and Welsh. *Apamea unanimis*, singly, on ragwort. *A. didyma* (oculea), *Miana strigilis*, *M. literosa*, common, on ragwort. *Grammesia trigrammica* (trilinea), singly, on ragwort. *Caradrina morpheus*, *C. quadripunctata*, sparingly, on ragwort. *Agrotis corticea*, singly, on ragwort. *A. nigricans*, abundant, on ragwort. *A. tritici*, *Triphæna ianthina*, sparingly, on ragwort. *T. comes* (orbona), common, on ragwort; fore wings very variable shades of rich red to brown. *T. pronuba*, common, on ragwort. *Noctua conflua*, common on ragwort; very variable. *N. xanthographa*, abundant, on ragwort. *Cosmia trapézina*, sparingly, on ragwort. *Celæna haworthii*, commonly during one week in August, not seen before or after. *Agrotis strigula* (porphyrea), singly, on heather. *A. simulans*, *Noctua glareosa*, *N. plecta*, singly. *N. baja*, sparingly. *Anchoceis helvola* (rufina), *Xanthia flavago* (silago), singly. *Dianthæcia capsicola*, common in larva stage; sparingly in imago. *Polia chi*, common, on stone walls; dark specimens. *Epunda nigra*, *Hadena adusta*, sparingly. *H. glauca*, singly. *Plusia chrysitis*, sparingly. *P. bractea*, singly, on phlox in evening. *P. festuca*, specimen seen, not captured; bright sunshine. *P. gamma*, abundant. *P. interrogationis*, sparingly; in rapid flight over heather, with sudden drops (into heather). *Amphipyra tragopogonis*, sparingly.

LARVÆ.—*Notodonta dromedarius*, common, birch and alder. *N. ziczac*, common, alder. *N. camelina*, common, alder and birch. *Dicranura vinula*, singly, birch. *Platypteryx lacertinaria*, abundant, birch.—M. A. ROLLASON; Drummuie, Golspie.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, January 23rd, 1907.*—At the Annual Meeting of this Society it was announced that the following officers and other members of the Council had been elected for the session 1907-8:—President, Mr. C. O. Waterhouse; Treasurer, Mr. A. H. Jones; Secretaries, Mr. H. Rowland Brown, M.A., and Commander J. J. Walker, R.N., M.A.; Librarian, Mr.

G. C. Champion, F.Z.S.; Council, Mr. G. J. Arrow, Mr. A. J. Chitty, M.A., Dr. T. A. Chapman, M.D., Mr. W. J. Kaye, Dr. G. B. Longstaff, M.D., Professor Raphael Meldola, F.R.S., Mr. F. Merrifield, Mr. G. A. K. Marshall, Mr. L. B. Prout, Mr. E. Saunders, F.R.S., Mr. R. Shelford, M.A., and Mr. G. H. Verrall.—The outgoing President, Mr. F. Merrifield, then delivered his Address, in which he discussed some of the causes of the persistent abundance or scarcity, generally or locally, of species and varieties of insects, and the relative importance of the consumption of their food and the attacks of their enemies. Reference was made to striking characters that seemed of no biological importance; to habits and activities not directly concerned with nutrition or reproduction, and the manner in which they are affected by external conditions; and to structure and fixed habits indicating their ancestral history and affecting their present capabilities.—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—December 13th, 1906. — Mr. Hugh Main, B.Sc., Vice-President, in the chair. — Messrs. Harrison and Main exhibited (1) series of *Anticlea rubidata* from North Cornwall and from Devon, the former less red and generally greyer; and (2) a bred series of *Chesias spartiata*. — Mr. Goulton, photographs of larvæ in their feeding and resting positions. — Mr. Garrett, series of *Euchloë cardamines*, *Lycæna (Agriades) corydon*, *Agriades (Urbicola) comma*, *Triphæna fimbria*, and *Limenitis sibylla*; the last-named from Arundel. — Mr. Kaye, a number of Syntomid moths from British Guiana, which showed strong constriction, or colour simulating constriction, in the basal segments of the abdomen, thus much resembling species of Hymenoptera, of which many were also exhibited. — Messrs. Rayward and Tonge, ova of *Zephyrus (Bithys) quercus*, in situ, below the winter-buds of oak. They were from Rammore Common. — Mr. Turner pointed out wintering cases of *Coleophora lutipennella* on the same buds, all extremely small. — Mr. Sich, specimens of *Tinea pallescentella* and gave notes on its occurrence, exhibiting *Gelechia pinguinella*, and *Borkhausenia pseudospretella*, which much resemble it in general appearance. — Mr. Newman, (1) a long bred series of *Caradrina (Laphygma) exigua*, with captured specimens for comparison, and a living *Stauropus fagi*, which emerged on December 9th. — Mr. Jennings, a series of *Oriorrhynchus blandus* from the Isle of Man. — Mr. Carpenter, (1) a *Pieris brassica* with the discal spot connected with the apical patch; (2) a bred series of *Melitæa athalia*; and (3) a series of *Plusia moneta* bred from larvæ found in his own garden. — Mr. East, J.P., gave an interesting account of the Victoria Falls of the Zambesi in explanation of a large number of lantern-slides exhibited by him.

January 10th, 1907. — Mr. R. Adkin, F.E.S., President, in the chair. — Mr. John Anderson, of Balham, and Mr. B. Richard, of Rotherhithe, were elected members. — Messrs. Harrison and Main, a long series of *Cidaria miata* bred from New Forest ova, and showing much variation in tone and mottling. — Mr. Newman, a large number of bred *Notodonta chaonia*, showing a good deal of variation in colour and banding. — Mr. Dod-, Lepidoptera from Africa, including *l'apilio demotens*, *Deiopeia pulchella*, *Danais dorippus*, &c. — Mr. Main, photographic stereoscopic views of natural objects. — Mr. R. Adkin, a speci-

men of *Epinephele ianira*, in which the usual tawny markings were of a straw-colour and somewhat extended.—Mr. Turner, a number of remarkable Hemiptera from South America, including mimics of beetles, seeds, thorns, &c., and the interesting moth-like species *Paciloptera phalænoides*.—He also showed a *Ctenonympha pamphilus* from Chipstead having pale patches on all four wings, and a series of *Vanessa (Aglais) urticae* showing restricted blue lunules in specimens from Engleberg and Lapland.—Reports of the various field meetings of the Society held during 1906 were read.—Mr. Adkin read a paper entitled “Further Notes on the Occurrence of *Tortrix pronubana* in England.”—HY. J. TURNER, *Hon. Report Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—December 4th, 1906—Annual Meeting.—Mr. W. Bloomfield exhibited *Lomaspilis marginata* with black marginal blotch intersected by a white line.—Mr. H. M. Edelsten, *Lithosia muscerda*, *L. caniola*, *L. complanula*, *L. griseola*, and var. *stramineola*, all bred *ab ovo*.—Mr. G. H. Heath, *Laphygna exigua*, from Sandown, Isle of Wight.—Mr. V. E. Shaw, *Apamea basilinea*, from Wye Downs, June, 1906, including a very pale specimen with obsolete orbicular and reniform only partially outlined.—Mr. A. Sich, *Gelechia pingunella* and *Borkhausenia pseudospretella*, to show the close resemblance between the two species, which he differentiated by several points, one of these being that in the hind wings of the former nervures six and seven spring from a common stalk, while in the latter these nervures are parallel.—The following executive were elected for 1907: President, Mr. A. W. Mera; Vice-Presidents, Dr. T. A. Chapman and Messrs. J. A. Clark, F. J. Hanbury, and L. B. Prout; Treasurer, Mr. C. P. Pickett; Librarians, Messrs. G. H. Heath and V. E. Shaw; Curators, Mr. T. H. L. Grosvenor and Dr. G. G. C. Hodgson; Secretaries, Messrs. S. J. Bell and E. Harris. Non-official Members: Rev. C. R. N. Burrows and Messrs. A. Bacot, H. M. Edensten, J. Riches, and P. H. Tautz.

December 18th.—Mr. A. Harrison exhibited a brood of *Pieris brassicae*, reared from ova laid by typical Liverpool females. Many of the females had black spots on fore wings connected by black scales on both upper and under surfaces, a continuous band being formed in a few extreme examples; the same peculiarity was exhibited to a lesser degree in a few of the males.—Dr. G. G. C. Hodgson, Australian Lepidoptera, including *B. sugriva*, which species has long slender tails to hind wings and ocelli on under side at the anal angle; the species rests either head downwards or horizontally, and Dr. Hodgson remarked that this fact, coupled with the fact that all the specimens observed were more or less damaged near the anal angle of the hind wings, suggested that birds were deceived by the resemblance of the tail end of the insect when at rest to a head with outstretched antennæ.—Mr. L. B. Prout, a long series of British *Larentia cesiata* and examples of this species from various European, American, Asiatic, and Australian localities, in illustration of the paper read by him on this occasion on the species in question.—Mr. A. J. Willson, *Oporina croceago* bred from Kent ova, which were of typical orange colour, while others bred from New Forest ova were of a pale salmon-pink colour.

January 1st, 1907.—The first meeting of the year was devoted, as usual, to a "pocket-box" exhibition, which met with less than the usual support, owing, doubtless, to the inclement weather and the fact of its being New Year's day. — Rev. C. R. N. Burrows exhibited abnormally small specimens of about a dozen species of Lepidoptera, including *Agrotis puta*, *A. saucia*, *Plusia gamma*, and *P. chrysis*; these were taken in September, 1906, and the exhibitor attributed their dwarfed appearance to the exceptionally dry and hot season. — Mr. S. J. Bell, a series of *Polia chi* taken on moors near Whitby during latter half of August. The species was abundant on the dark stone walls common to the district, but no dark specimens were seen. — Mr. H. M. Edelsten, very dark *Acronycta menyanthidis* from Yorks. — Mr. T. H. L. Grosvenor, *Argynnis selene* from Ashdown Forest, including male with confluent marginal spots, and a female much suffused with black scales. — Dr. G. G. C. Hodgson, long series of *Lycæna corydon*, *L. bellargus*, *L. aleris*, and *L. ægon*, arranged so as to demonstrate parallel variation. — Mr. L. A. E. Sabine, two specimens of *Thyatira batis*, the one from Epping with accentuated pink coloration, and the other from New Forest with this colour entirely lacking; the latter thus representing the Linnæan type. — Mr. V. E. Shaw, *Sesia chrysidiformis*, Folkestone, July, 1906, and *Pieris crataegi*, East Kent, July, 1906; also *Lytta vesicatoria*, which was found in abundance near Dover in July, 1906.

January 15th.—Mr. J. A. Clark exhibited a specimen of *Tanioscampa cruda* var. *haggerti* (Tutt). — Mr. E. A. Cockayne, *Thera variata*, with interrupted central fascia, from Rannoch; also *Arctia fuliginosa* var. *borealis* from same locality. — Mr. H. M. Edelsten melanic examples of *Hemerophila abruptaria* from Clapton, *Nonagria geminipuncta* from Enfield, and *N. typæ* and *N. canna* from Norfolk Broads. — Mr. T. H. L. Grosvenor, *Lycæna agestis* ab. *ornata* from Surrey, and vars. *atrina* (?) and *obsleta* from Aberdeen. — Mr. A. Harrison, melanic specimens of about twenty species, including *Cymatophora duplaris* and *Acronycta leprina* from Cornwall and Launceston, *A. rumicis* from Westmoreland and Barnsley, and *A. nebulosa* from Cornwall, Epping, and Delamere. — Mr. L. W. Newman, a large number of melanic Lepidoptera, including *Stauropus fagi*, *Boarmia consortaria*, *Odontopera bidentata*, and *Boarmia abietaria*. — Mr. L. A. E. Sabine, *Arctia fuliginosa* from Rannoch, including a specimen with black abdomen and hind wings. — Mr. H. B. Whitehouse, two melanic specimens and one intermediate form of *Liparis monacha* bred from dark Hull females; also *Sphinx pinastri* bred from Arlington (Suffolk) females. — Mr. L. W. Newman read a paper dealing with his experiences in breeding various melanic forms of Lepidoptera. — S. G. BELL, Hon. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The usual monthly meeting of this Society was held in the Royal Institution, Colquhoun Street, Liverpool, on December 21st, 1906, Mr. W. Mansbridge, Vice-President, in the chair. — Mr. A. J. Wightman, of Reigate, was elected a member of the Society. — A paper was read by Mr. F. N. Pierce, F.E.S., entitled "Notes on the Structure of *Malacosoma hybrid schaufussi* (*M. castrensis* × *M. neustria*)." The paper was admirably

illustrated by microscope preparations of the insects named, as well as of *M. franconica*, shown upon the screen by the aid of the micro-lantern. The author pointed out that, unlike the usual mixture of male and female genitalia obtaining in the case of hybrids, the sexes of *schaufussi* possessed unmixed organs proper to the respective sexes. From a consideration of the details of the structure of the hybrid moths they are seen to combine the distinguishing features of each of the parent species, though perhaps leaning more toward *neustria*. The scales also showed modifications, being intermediate in form and size between those of the parents from the same part of the wing.—Mr. Fred. Birch, who shortly sails for Brazil upon a collecting expedition, gave a most interesting address upon his experiences in Trinidad when in quest of tropical Lepidoptera; his original observations upon the habits and peculiarities of the butterflies of the island were much appreciated by the members present.—The following exhibits were made, *viz.*, by Mr. Oulton Harrison: An album of photographs of Lepidoptera in their various stages, taken by Mr. Hugh Main, of London; also, on behalf of the Rev. T. B. Eddrup, of Horbury, melanic *Agrotis agathina* from the West Riding, *Boarmia repandata* from Horbury, and its variety *conversaria* from Barmouth.—The Honorary Secretary showed, on behalf of Mr. R. Hancock, of Birmingham, a number of photographs of Lepidoptera, and read a letter relating to the exhibit.—Mr. W. Mansbridge, a short series of *Triphaena comes* var. *curtisii* from Aberdeen, and a series of the chocolate form of *Hemerophia abruptaria* from the London area, together with examples of the type for comparison; also melanic specimens of *A. agathina* from Delamere for comparison with Mr. Eddrup's; they were seen to be more smoky in ground colour than the West Riding specimens, appearing quite dull beside them.—Mr. Oscar Whitaker exhibited lantern-slides of the exotic cockroaches *Blaber gigantea* and *B. marmorata* from the collection of Mr. E. J. B. Sopp.

The annual meeting of the Society was held in the Royal Institution, Liverpool, on January 17th, 1907, Mr. Richard Wilding, Vice-President, in the chair.—Lieut. the Hon. R. O. B. Bridgeman, R.N., of Salop, was elected a member of the Society.—The following office-bearers were elected for the ensuing year:—President, S. J. Capper, F.E.S.; Vice-Presidents, Dr. J. H. Bailey, M.B. (Port Erin), E. J. B. Sopp, F.R.Met.S., Prof. E. B. Poulton, M.A., D.Sc., F.E.S., J. R. Charnley, F.Z.S., F.E.S., Dr. H. H. Corbett (Doncaster), Wm. Mansbridge, F.E.S.; Treasurer, Dr. J. Cotton, F.E.S.; Secretaries, H. R. Sweeting, M.A., Wm. Mansbridge, W. D. Harrison; Editor, J. R. le B. Tomlin, M.A., F.E.S.; Librarian, F. N. Pierce, F.E.S.; Council, J. Kidson Taylor (Buxton), W. Webster, M.R.S.A.I., F. R. Dixon-Nuttall, F.R.M.S., Dr. P. F. Tinne, M.A., M.B., the Rev. T. B. Eddrup, M.A. (Wakefield), C. E. Stott, R. Tait, Junr., Dr. P. Edwards, J. Collins (Oxford), R. Wilding, O. Whittaker, Dr. Wm. Bell, J.P.—After the formal business of the meeting, the retiring Vice-President, Prof. T. Hudson Beare, B.Sc., F.E.S., of Edinburgh, communicated his address to the Society. The Professor, after detailing the chief scientific achievements of entomologists during 1906, made a number of interesting and valuable suggestions for individual as well as collective furtherance of our studies, and instanced the remarkable work

accomplished by such diligent investigators as Dr. Joy, Mr. H. St. J. K. Donisthorpe, and others, among the rarer or least-known Coleoptera occurring in Great Britain. A vote of thanks to the author was proposed by Mr. Wilding and seconded by Mr. E. J. B. Sopp, F.R.Met.S., and it was resolved to print the paper in the Society's Proceedings.—The following exhibits were made by the members:—Dr. Cotton, a long series of *C. typhon* var. *rothleibii* from Witherslack; a series of *Lycæna astrarche* var. *salmacis* from North Lancashire; and a series of *Noctua glaucosa* from Delamere. Mr. H. R. Sweeting, a number of *Cynthia cardui* from Eastbourne; a specimen of the rare moth *Deilephila livornica* taken at light in Knowsley Park last June; *Macaria liturata* and its var. *nigrofulvata* from Delamere; and *Lycæna icarus* and *L. corydon* from Eastbourne. Mr. F. N. Pierce, F.E.S., a box of Lepidoptera from India. Mr. J. J. Richardson brought moths collected in the neighbourhood of Bidston, Cheshire, at ivy-bloom—a series of *Himera pennaria*, *Cerastis racinii*, *Luperina testacea*, the last from Wallasey, and *Hybernia defoliaria* from Sefton Park, Liverpool. Mr. W. Mansbridge, *Carpocapsa nimbana* and *Sciaphila communana* from the London district, received from Mr. A. Thurnall, of Croydon; these two rare species attracted a good deal of attention.—The Honorary Treasurer's report showed the Society to be in a very satisfactory position, a fact which the Council hope to make full use of in the preparation of the annual account of the Society's work—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—November 19th, 1906.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. L. Doncaster, The University, Birmingham, and Mr. Hubert Langley, Narborough House, Leamington, were elected members of the Society.—Mr. E. C. Rossiter exhibited a box full of Lepidoptera taken by himself at Brading, Isle of Wight, last August. The most interesting species was *Pyrausta flavalis*, Schiff., which occurred in hundreds; there were also *Acontia luctuosa*, Esp., *Agrotis vestigialis*, Rott., *Sclidosema ericetaria*, Vill., *Acidalia marginipunctata* Göze, &c.—Mr. G. T. Fountain showed a nice series of *Lycæna arion*, L., from Cornwall.—Mr. S. H. Kenrick exhibited four species of New Guinean Erycenidæ, and pointed out the great difference in general appearance between them and the western species.—Mr. W. Harrison showed various Noctuæ bred from dug pupæ, including *Agrotis plecta*, L., which species he said had emerged in February without any forcing.—Mr. W. E. Collinge showed living unnamed hymenopterous parasites from larvæ of *Agrotis segetum*, Schiff., and from the ova of *Smerinthus ocellata*, L.—Mr. A. H. Martineau showed galls of the gall-fly from *Potentilla reptans* = *Nestophanes potentillæ*, which he found in abundance in Devonshire, the only county whence it has been obtained at present.—Mr. Hubert Langley showed *Chrysoclista linneella*, Cl., from Leamington, where he had found it on the limes in the greatest abundance. So numerous was it that, on one occasion, he counted fifty-seven on one tree-trunk. He also showed *Zygæna loniceræ*, Scheven, which he found commonly at Southam, near Warwick.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

1. *The Annals of Scottish Natural History*. Edinburgh. 1906.

Although treating of natural history in a very wide sense, no student of the British insects can safely leave this excellent periodical unexamined. This year the dipterist is the one most extensively catered for.

2. *Museum Gazette and Journal of Field-Study*. Conducted by JONATHAN HUTCHINSON, &c, Illustrated. Haslemere.

This monthly magazine contains readable popular articles on all sorts of out-of-door subjects. The list of books, &c., for sale at the museum gives an unfortunate trade appearance to what should, nevertheless, be a useful periodical to the not too advanced naturalist.

3. *The Science of Dry Fly Fishing*. By F. G. SHAW. London: Bradbury, Agnew & Co., Ltd. 1906.

A fly-fisher need not necessarily be an entomologist, although there is little doubt that a knowledge of entomology will make even a good fly-fisher a better one. In any case we have here clearly a good textbook, well got up and beautifully illustrated. If the entomologist would not go to it to study entomology, he should, at any rate, look at the illustrations of insects, by Horace Knight, in Plates xv. and xvi.

4. *First Report of the Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii*. Honolulu. 1905.

A long report of 170 pages, but apparently containing little of interest to the entomologist generally. A great part is confined to forestry.

5. *The Bombay Locust, *Acridium succinctum* (Linn.), (from *Memoirs of the Department of Agriculture in India*)*. By H. MAXWELL-LEFROY. 112 pages, 13 plates. Calcutta. 1906.

A long and full account of the insect, its attack, and the mode of combating it.

6. *The Western Pine-destroying Bark Beetle, *Dendroctonus brevicornis*, Lec. (Some Insects injurious to Forests)*. By J. L. WEBB. 14 pages, 2 plates, and 6 illustrations in text. Washington. 1906.

"Object of the paper to give available information on this insect and methods of combating it."

7. *Notes on Exotic Forficulids or Earwigs, with descriptions of New Species*. By J. A. G. REHN. Illustrated. 15 pages. Washington. 1905.

8. *Notes on South American Grasshoppers of the Sub-Family Acridinæ (Acrididæ), with descriptions of New Genera and Species*. By J. A. G. REHN. 21 pages. Washington. 1906.

9. *The Locustidæ and Gryllidæ (Katydidæ and Crickets) collected by W. T. Foster in Paraguay*. By A. N. CAUDELL. 10 pages. Washington. 1906.

10. *Synoptic List of Paraguayan Acrididæ, with descriptions of New Forms.* By L. BRUNER. 82 pages, 3 plates. Washington. 1906.

W. J. L.

Butterflies of Hongkong and South-East China. By J. C. KERSHAW, F.E.S., F.Z.S. Hongkong: Kelly & Walsh, Ltd. London Agent, R. H. Porter. 1906.

OF this work, which it is understood will be completed in about six parts, we have received the first three instalments. Part I., fourteen pages and two plates, deals with the Danainæ. Part II., eighteen pages and three plates, treats of the Satyrinæ, Morphinæ, and a portion of Nymphaliniæ. In Part III. the remainder of the Nymphaliniæ and the Erycinidæ are considered; there are twenty-eight pages and four plates in this section.

The plates, i.-vii., reproduced from coloured drawings in "colour-type," are well covered with figures. All the plates are on paper less in size than that upon which the text is printed; the latter is a folio, 10 x 15 inches, whereas the plate-paper is a quarto, 11 $\frac{7}{8}$ x 9 $\frac{1}{8}$ inches. Two of the plates, each with a single figure, are not numbered, and appear to be "extras." Although the leaves bearing the plate explanations are not numbered, they seem to have been included in the enumeration of the pages.

A List of the Lepidoptera of Shepton Maliet and District, with Remarks as to Localities, &c. By W. A. BOGUE, F.E.S.

THE two hundred and forty-five species, chiefly collected by the author, mentioned in this list comprise thirty-two Rhopalocera, eighty-six Geometridæ, and eighty-three Noctuidæ.

WE have also received the following publications of the U.S. Department of Agriculture (Bureau of Entomology):—

Bulletin No. 59. *Proliferation as a Factor in the National Control of the Mexican Cotton Boll Weevil.* By W. E. HINDS, Ph.D. Pp. 45, plates i.-vi.

Bulletin No. 60. *Proceedings of the Eighteenth Annual Meeting of the Association of Economic Entomologists.* Pp. 1-206, plates i.-iii., and several illustrations in text.

Bulletin No. 62. *The San Jose or Chinese Scale.* By C. L. MARLATT. Pp. 1-89, plates i.-ix., and 12 text figures.

Technical Series, No. 12, Part I. *Catalogue of recently described Coccidæ.* By J. G. SANDERS, M.A. Pp. 1-18.

Technical Series, No. 13. *A Revision of the Tyroglyphidæ of the United States.* By NATHAN BANKES. Pp. 1-34, plates i.-vi.

Farmers' Bulletin, No. 264. *The Brown-tail Moth, and How to Control it.* By L. O. HOWARD. Pp. 1-22, and 10 text illustrations.

THE moth referred to is the European species *Euproctis* (*Porthesia*) *chryorrhæa*, L., which was accidentally introduced into New England some fifteen years ago. (See also Dr. Smith's remarks on this species and other Liparid moths, *Report of the Entomological Department of the New Jersey Agricultural College Experiment Station for 1905.*)

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NOTES ON THE NOMENCLATURE OF SOME HYMENOPTERA.

By T. D. A. COCKERELL.

IN the course of my work I have come across a number of names, currently in use for Hymenoptera, which appear to need rectification. A brief account of these is given herewith.

EUGLOSSIDÆ.

Eulema mussitans (Fabr.).

Apis mussitans, Fabr., 1787. This has been referred by all recent writers to *E. surinamensis*, based on *Apis surinamensis*, L., Syst. Nat. p. 579, No. 36. It is not, however, *A. surinamensis*, L., Syst. Nat. p. 575, No. 6, which is described as "*A. atra*, alis atro-cærulescentibus, abdominis petiolo obovato. Habitat in America, Rolander. Magna, facie Sphegis, sed lingua instructa." This latter is a wasp, doubtfully identical with *Zethus mexicanus* (L., 1767). Friese has described a variety from Venezuela, which will stand as *Eulema mussitans nigrifacies* (Friese).

ANTHOPHORIDÆ.

Anthophora atrocincta, Lep., 1841.

Apis plumipes, Fabricius, 1781 ; not Pallas, 1772.

South Africa (Dalla Torre wrongly gives the locality as India). I have specimens from Dr. Brauns.

Habropoda montana, Rad., 1882.

Dalla Torre referred this to *Podalirius*, and then changed the name to *P. radoszkowskii*, because of the prior *P. montanus* (Cresson). Bingham correctly refers the insect back to *Habropoda*, but retains Dalla Torre's specific name, which is quite unnecessary.

Tetralonia phryne (Nurse), *T. pomona* (Nurse), *T. cassandra* (Nurse).

These North Indian species are described by Nurse in 1904 under *Encera*, subg. *Macrocera*, with the remark that *Macrocera* has priority over *Tetralonia*. *Macrocera*, however, is a homonym, and in my opinion *Tetralonia* is a valid genus.

MEGACHILIDÆ.

Megachile mendozana, n. n.

Megachile cornuta, Smith, Deser. New Sp. Hym. 1879, p. 78; Ckll., Trans. Amer. Ent. Soc. 1905, p. 341 (Argentine); not of Latreille, Hist. Nat. Ins. 1805, p. 59.

ANDRENIDÆ.

Andrena radoszkowskyi, Schmiedeknecht, 1883.

Andrena fasciata, Radoszkowsky, 1876; not Fabricius, 1775; not Imhof, 1832. Caucasus.

Andrena ducis, n. n.

Andrena transcaspica, Radoszkowsky, 1893; not Radoszkowsky, 1886.

A. radoszkowskii, Dalla Torre, Cat. Hym. x. 149 (1896); not Schmied. 1883. Central Asia.

MUTILLIDÆ.

Mutilla cameronella, n. n.

Mutilla confusa, Cameron, Biol. Cent.-Amer. 1894, p. 115 (Panama); not of Lepel. 1845.

Mutilla wallacei, n. n.

Mutilla nigra, Smith, Journ. Proc. Linn. Soc., Zool., 1858, p. 151 (Aru Is.); not of Rossi, 1792. See also E. André, Ann. Mus. Civ. Genova, 1896, p. 78 (New Guinea).

Mutilla saharæ, n. n.

Mutilla fasciata, Klug, Symb. Phys. 1829 (Sahara); not of Olivier, 1811.

M. (Stenomutilla) argentata var. *aucta*, Lep., cannot take the earlier name *bifasciata*, Klug, 1829, because of the still earlier *bifasciata*, Swederus, 1787 (= *occidentalis*, L.). However, the name *rondanii*, Spinola, is two years older than *aucta*.

SCOLIIDÆ.

Compsomeris druryi, n. n.

Vespa maculata, Drury, 1773; not of Linné, 1763.

Scolia quadrimaculata, Fabricius, 1804; not of Fabricius, 1775. Jamaica.

LARRIDÆ.

Dinetus pictus (Fabr.).

Sphex guttata, Fabricius, 1793; not of Gmelin, 1790.

The name *D. pictus*, commonly used by authors, is wrongly made to give way to *D. guttatus* in Dalla Torre's catalogue.

CRABRONIDÆ.

Crabro dives schenckii, n. n.

Crabro pictus, Schenck, Jahrb. Ver. Naturk. Nassau, 1857; not of Fabricius, 1793 (= *Dinetus*).

Solenius rufipes (Lep.).

Crabro rufipes (Lep.) Smith, was described under *Ceratocolus*. If it is left in *Crabro* it must take the name *C. excavatus*, Fox, because of *C. rufipes*, Fabr., 1787 (? = *Cerceris tuberculata*); but if we follow Ashmead in placing it in *Solenius*, the original name remains.

ORTHOPTERA IN 1905 AND 1906.

BY W. J. LUCAS, B.A., F.E.S.

NEITHER in 1905 nor in 1906 did anything of special interest with regard to our Orthoptera come under my ken; still, as the sum of our knowledge is made up of details, it will not be out of place to put on record even the trivialities that have been noted, seeing especially that it is in consequence of such small details not being recorded that our knowledge of this order is so incomplete. There are, in fact, some counties in England (Shropshire, for instance) of whose orthopterous fauna we seem to have absolutely no records whatever, and yet surely there are some naturalists who could tell us at least if the common earwig and the kitchen cockroach exist there, for we cannot be said to know that they do.

1905. On February 25th male specimens of *Forficula auricularia* were found inside dead and hollow stems of deadly nightshade (*Atropa belladonna*) on the Roman Road, near Leatherhead. Specimens found hibernating are usually females, but this find seems to indicate that the males hibernate also. Of this species one or two aberrations were met with. A dark female was taken by Mr. F. M. Carr in the New Forest in April. Mr. R. A. R. Priske kindly gave me a male with aberrant forceps (the left branch being normal, but the right as large as in var. *forcipata*), which he took at Deal in September. Amongst a number of earwigs found in a garden in the town of Warwick (September 7th-11th) was a male with very abnormal forceps

(= cerci). They are long and slender, but the chief peculiarity is that they are soldered together at the base, while the distal part seems to be jointed to the basal, which, if this is the meaning of the peculiarity, is of interest in connection with the fact that the cerci of other Orthoptera are regularly jointed. Commander Walker has succeeded in adding somewhat to our knowledge of the distribution of *Forficula lesnei*. He was kind enough to give me a female which he took at Queendown Warren, near Chatham, Kent, probably in 1899; while he tells me that he took a female in moss at Streatley, Berks, on the 21st October, 1905. This second specimen was no doubt hibernating.

As regards the short-horned grasshoppers (Acridians), the little hibernating species, *Tettix bipunctatus*, was found in the New Forest on April 1st. Of the rest, *Gomphocerus maculatus* was the first that I met with mature, the locality being near Oxshott, Surrey, and the date July 17th. On the downs near Clandon, Surrey, grasshoppers were seldom mature on July 20th. *Mecostethus grossus* still continues to show itself in new localities in the New Forest; in fact, one seldom examines in August one of the numerous bogs without meeting with this large and handsome species. Its habits are most interesting to watch in freedom, while, if fed on grass and not kept in too dry a place, it will live for some time and its habits may be watched, in captivity. *Stenobothrus rufipes*, of both sexes, was found in a ride in Perry Wood, in the New Forest, on August 9th. This species in captivity also feeds readily off grass, eating along the margin of the leaf. One was kept alive thus for six or seven weeks, and it only succumbed about October 14th. Of *S. bicolor*, both sexes were taken at Hurst Castle on August 7th. The much less common species, *S. elegans*, was met with twice in the New Forest. On August 8th a female was taken near Highland Water, just beyond Queen's Mead, and it was found much more commonly at Matley Bog on August 23rd. No other grasshoppers seemed to be present with it at the latter locality, where more females were noticed than males. Many of the former were green, but some were of a rather rich brown colour; the streak on each side, both on wings and pronotum, is often very conspicuous in this sex, in which also the elytra do not reach to the extremity of the abdomen. The males are more active than the females. Mr. A. H. Hamm took the species at the Deal sand-hills, where the specimens were brownish in colour, harmonising with the soil, as the green ones did with the grass in the New Forest. *S. parallelus* was taken near Warwick on September 10th, and on Arbrook Common, Surrey, on October 1st. *Gomphocerus maculatus* was noted by myself at Need's Ore, Hants, on August 10th; while Colonel Yerbury gave me a specimen taken at Nairn, in Scotland, on the 3rd. The

peculiar little *Tettix bipunctatus* was met with at Horsley on May 27th, and at Bookham Common on May 31st; while Colonel Yerbury gave me Scotch specimens taken at Nairn on May 18th and June 6th, at Brodie on June 5th, and at Nethy Bridge on June 15th.

Of the long-horned grasshoppers (Locustids), I have records of but three species. Mr. B. G. Cooper gave me a female specimen of *Locusta viridissima*, which he took on the downs near Swanage, well "protected" on a furze-bush. Mr. H. M. Edleston sent me specimens of *Platypleis grisea*, taken at Dartmouth at sugar, which they were eating. He says "one female was laying eggs in one of the posts; it had its ovipositor thrust deeply into a chink in the wood. What curious black cigar-shaped things the eggs are! One female had the top of its head and the plate on the thorax quite red. Females were more plentiful than males." Two females of *P. brachyptera* were taken near Oxshott on September 30th, and kept in captivity. About a week later one partly devoured the other. Whether the victim became moribund, or whether it was forcibly overcome by the other, I cannot say; but, as was clear from movements of its jaws, it was not lifeless while the other was feeding upon it. Grass had been supplied to them, but I cannot say that they fed on it, and it soon got dry each time. *L. viridissima* has been credited with similar tendencies, and possibly few of our Orthoptera are entirely without carnivorous, if not cannibalistic, habits.

1906. On January 14th, in a damp rotting tree-stump on Esher Common, a male *Forficula auricularia* was found hibernating, thus confirming my observation of the hibernation of this sex in 1905. On January 28th—also on Esher Common—I found beneath some Scotch firs, about two or three inches under ground, a female of this species, with her eggs, near the rhizome of a bracken-fern. They were placed in a glass-topped box with a little moss and soil. Later, the mother was seen carefully hunting over the soil, and, on finding an egg, picking it up and carrying it away in her jaws to the shelter of the moss out of sight. On January 31st there was a little heap of sixteen eggs. Though they are fairly large, this seems a small number; but perhaps some were lost when I inadvertently brought them to light in the woods. The egg is just over a millimeter long, and just under one broad; it is yellowish in colour, with perhaps a faint tinge of green, and appears to have no markings. On February 2nd, and on the morning of February 3rd, the mother was apparently "brooding over her eggs," but after that they seemed to be scattered and neglected. On February 7th they were in the same state, and on examination with a lens I found several, at least, were bent in on one side; I concluded that they were dead, and that the mother knew the fact. This date

(January 28th) seems early for eggs; and, indeed, on April 25th, in the New Forest, I found, in a piece of a decaying branch on the ground, two females of the same species, together with some eggs and some very young nymphs. *F. auricularia* was noticed at sugar in the New Forest on August 27th and in Kew Gardens on September 22nd. On November 24th Commander Walker took a male *F. lesnei* in a tuft of grass at Headington Wick, near Oxford. This capture is of special interest as pointing to the fact that of this species also the male hibernates as well as the female. The branches of the forceps were rather more parallel than usual. The same energetic naturalist sent me a number of specimens of *Anisolabis annulipes* from the "sack-heap" on the premises of the Sheppey Glue and Chemical Works, Queenborough. He says they were more common than he had seen them before, but *Apterygida arachidis* was quite rare.

Ectobia panzeri, our smallest cockroach, was found in the New Forest by Blackwater Stream, near Queen's Bower, on August 10th; near Beaulieu River, on August 18th; at Holmsley (two dark ones), on August 21st; and near Ober Water Stream, not far from Brockenhurst (one dark specimen), on August 31st. Neither *E. lapponica* nor *E. livida*, though specially sought for, could be found.

This season a mature *Gomphocerus maculatus* was found on Esher Common as early as June 23rd, while a *Stenobothrus viridulus* was taken mature in the same place on July 3rd. The latter species I was pleased to receive from Mr. K. J. Morton, taken at Carluke, in Scotland, on August 6th; and at Emyvale, Co. Monaghan, in Ireland, July 20th–30th. In the New Forest, on September 2nd, I attempted to catch what I took to be a pair of the large hornet-fly (*Asilus crabroniformis*). One flew away, however, as I approached, and the other fell to the ground. What was my surprise to find that the latter was a male *Mecostethus grossus*, dead, or apparently so! The prey was as large as the captor. *Stenobothrus bicolor* was noted or received from several localities—near Lulworth Cove, August 28th; at Kingsley, Bucks, September 5th; on the White Horse Hills, Berks, near the "Blowing-stone" and Letcombe Bassett, September 8th; near Newland's Corner, Surrey, September 11th; Great Malvern; Kew Gardens; the Royal Horticultural Gardens at Wisley, Surrey; and at Chiswick (A. Sich), on October 8th, in the road near a meadow. The last record is of interest owing to the approach of London in that direction. On August 21st, near Holmsley Station, in the New Forest, *S. elegans* was met with in large numbers near boggy ground. Several localities for the common *S. parallelus* were noticed—near the Itchin at Eastleigh, August 14th; near Lulworth Cove, August 28th; near Ilmer, and at Kingsley, Bucks, September 5th; on Chilswell Hill, Berks, September 7th; near the "Blowing-stone" and Let-

combe Bassett, September 8th; near Newland's Corner, September 11th; Beachy Head, September 20th; and Kew Gardens, September 22nd. *Tettix bipunctatus* was found near the Itchin at Eastleigh on August 14th, and was received from the Royal Horticultural Society's Gardens at Wisley.

To turn now to the Locustids. *Leptophyes punctatissima* and *Meconema varium* were received from Hanwell (W. M. Webb), having been taken on September 4th, and the latter was also received from the Royal Horticultural Society's Gardens at Wisley. *M. varium* came to sugar in the New Forest on August 23rd and 27th, and in Kew Gardens on September 22nd. Mr. H. M. Edelsten sent me specimens of the local *Xiphidium dorsale*, which he found very common on reeds at night in the Norfolk Broads on July 28th and 29th. A specimen of *Thamnotrizon cinereus* came to sugar in the New Forest on August 27th. The last grasshoppers seen by me were a female *Platycleis brachyptera*, near Oxshott, Surrey, on October 6th, and another female of the same species on Esher Common, in the same district, on October 14th.

Kingston-on-Thames: February, 1907.

SCOTCH LEPIDOPTERA IN 1906.

By A. E. GIBBS, F.L.S.

DURING the greater part of the past season, Mr. L. G. Esson was collecting for me in Perthshire, Aberdeenshire, or Elgin, and a summary of the results achieved may be worth putting on record. Work began on the 20th of March, when Mr. Esson, who had reached Struan the previous night, arrived at Rannoch to search for *Petasia nubeculosa*. Six hours' work in the far-famed Black Wood yielded only half a dozen specimens of *Semioscopus avellanella*, an insect which was subsequently taken in large numbers. The next day's exertions, however, were attended by better luck, for one *Asphalia flavicornis* and two "sprawlers"—one of each sex—rewarded his careful search of the birch-trunks. The *nubeculosa* were freshly emerged specimens, but unfortunately the male bled rather badly on its journey to England, which slightly spoiled it for cabinet purposes. On the 22nd another was taken, and between that date and the end of the month seven others were secured. Only twice were two specimens found on the same day. Two small batches of eggs were obtained, numbering twelve and thirteen respectively, but, as one of my boxes got smashed in the post, about half of them were lost. During my absence from home

Mr. P. J. Barraud kindly took charge of them for me, and nine young larvæ resulted. These were fed up on birch, sleeved out in my garden, and left pretty much to their own devices. Six of them successfully pupated at the end of June in some blocks of peat placed in the bottom of the sleeve, and I suppose it is possible I may have to wait four or five years before the moths emerge. My short series of ten "sprawlers" exhibits considerable variation in the intensity of colouring, one male being exceptionally light, while in the ground colour of another specimen (a female) there is a suffusion of reddish brown. The *A. flavicornis*, of which a number were taken in March and April, are of the usual Rannoch form (var. *scotica* of Staudinger, I think), many of them handsome, boldly-marked insects with large silver-grey patches on the costa. They vary in the number and intensity of the transverse markings, and lack the greenish-grey appearance of our southern forms. Sugaring during these early months of the year did not yield very good results, only a few hibernated specimens of *Cerastes vaccinii*, *Scopelosoma satellitia* and *Calocampa exoleta* appearing. The weather was cold and discouraging, and at the end of the month of March I withdrew my collector for a time; but about the middle of April I sent him back to Perthshire, with the object, chiefly, of getting a series of *Nyssia lapponaria*, and this proved to be one of the most successful quests of a bad year, notwithstanding the continual rain and sleet which prevailed. Mr. Esson describes it as rough work searching for *N. lapponaria* amid bogs and boulders, the long wet vegetation proving very destructive to shoe-leather. The insects are to be discovered settled on the branches of heather and bog-myrtle, but may also be found on posts and fences. After a fall of snow the apterous females resemble little snowballs, and are not easily seen. Several travelled to Hertfordshire safely in chip-boxes, and they deposited eggs freely in the folds of crumpled pieces of muslin; between the layers of fragments of corrugated packing-board with which I supplied them; in the crevices of chip-boxes; or, indeed, in any cranny into which they could insect their long ovipositors. This is not an easy species to rear. I distributed a good many ova, but it is to be feared that few pupæ have resulted, and it remains to be seen from how many of these moths will emerge safely. A few varieties of *Tæniocampa gothica* and *T. instabilis* were taken during April and May. *Lobophora carpinata* was abundant, and in the latter month a few nice varieties of *Cidaria suffumata* were secured. Bad weather continued to interfere with collecting, but a very satisfactory lot of *Anarta cordigera* made prospects appear more cheerful. On May 19th, in company with Mr. T. Salvage—who, I believe, was working at Rannoch for a syndicate—Mr. Esson found *A. cordigera* flying "all over the hills," in a gale of wind, which made them difficult to catch. Returning at

five o'clock in the afternoon, to search for them at rest, they were successful in obtaining rather a long series. Mr. Esson tells me that his experience shows that they do not habitually settle on the ground, as has been stated, but on stones about the size of a man's head; and the way to secure them is to stalk them with the sun in your face, a swift down stroke with the net being necessary. He further expresses the opinion that *cordigera* will not pair unless the sun is shining. *Fidonia carbonaria* was not very plentiful in 1906; a month's hard work only resulted in the capture of about a score of specimens. The weather continued to be most disheartening, and at the end of May I withdrew Mr. Esson from Rannoch; but in a day or two it cleared up and appeared more promising, so we decided to try again. He went back, and on June 9th sent me the first lot of *Anarta melanopa*, among them being a curious dwarf form. On account of the storms it was very difficult to obtain this insect in good condition, most of those sent to me being more or less "bald-headed." Two specimens of *Crymodes exulis*, of the *assimilis* form, were taken at sugar on the north side of the loch.

We were anxious to obtain pupæ of *Pachnobia alpina*, but, although a careful search was made among the moss in the usual localities, it unfortunately proved futile, though I believe Mr. Salvage met with better success. Sugar during June and July produced a good series of *Hadena rectilinea*, *H. contigua*, *H. adusta*, *Noctua brunnea*, *N. festiva* (rather varied), *Xylophasia rurea* (some pretty silvery forms), six *Aplecta occulta*, four *A. herbida*, and twelve *A. tincta*. An interesting lot of *Cymatophora duplaris* were secured, and other things worth mention include *Nemeophila* var. *hospita*, *Acronycta myricæ*, *A. ligustri*, *A. meny-anthidis*, *Stilbia anomala*, and *Hadena glauca*. Two specimens of *Plusia bractea* were taken on August 1st at honeysuckle-bloom. Among the Geometers, the best things were *Larentia flavicinctata*, of which eleven were obtained on Schiehallion on a wet day at the beginning of August. Some interesting forms of *Cidaria corylata* came from Corrie Wood, where also the Scotch form of *Drepana falcataria*, with white ground colour, was found sparingly. Of *Emmelesia ericetata* and *E. blandiata*, long but not very variable series were sent, and other Geometers in the collection included *E. alchemillata*, *E. albulata*, *Melanthia ocellata*, *Melanippe tristata*, *M. sociata*, *Coremia munitata*, *Cidaria miata*, *immanata* (some striking forms), *Larentia cesiata*, *Zonosoma pendularia*, &c. *Scopula alpinalis* was abundant on the mountains and in fine condition.

During the greater part of August, Mr. Esson worked in the neighbourhood of Aberdeen, whence he sent me, among other things, *Mamestra furva*, *Noctua sobrina*, *Agrotis lucernea*, *Orthosia suspecta*, *Calocampa solidaginis*, and other insects, for which this locality is famous. On the 27th of that month he went to Forres,

but bad weather again interfered with his work. Here the bag included two pleasing varieties of *Triphæna orbona*, four *Aporophyla nigra*, two *Cosmia paleacea*, and two *Noctua depuncta*, a species which was practically over, the specimens being much worn.

Kitchener's Meads, St. Albans.

"CURRENT CRITICISM."

BY G. W. KIRKALDY.

I CANNOT accept Mr. Distant's explanation (Entom. xl. 2) of the mistake he has made in the synonymy of *Cicadetta annulata* and *hageni*. Mr. Distant (on p. 166 of the 'Catalogue of Cicadidæ') first positively gives Hagen's *annulata* as a synonym of Brullé's, then (on p. 168) cites it as a supposed separate species. If he had intended to mean that Hagen's species was composite, he would, as elsewhere in the Catalogue, have written "(part)" after each citation. Fieber does not give, as a synonym of *hageni*, "part of Hagen's species," but the *whole*, and the two forms are still regarded as distinct by the best palæarctic authority, viz. Dr. Puton. The fact is that Mr. Distant, by mistake, inadvertently cited "*Cicada annulata*, Hagen," as a synonym of *C. annulata*, Brullé; and on p. 166 of the Catalogue the entire reference to Hagen under "*annulata*" should be deleted. 'I was not carping at what is really a trivial error, but simply pointing it out for adjustment.

Mr. Distant has misunderstood my remarks on Amyot's mononymics. It is absurd to suppose that I was not aware that Stål and Karsch adopted them. I did not say Amyot's mononymics have no place in the literature of binomial nomenclature, but that they "have no place in binomial nomenclature," *i. e.* they cannot be justly used therein. Amyot founded his system expressly to supplant that of Linnæus, and anyone who will read Amyot's preface, and study the application of the names in the body of the work, will, I am sure, at once rule them out of court for use in binomial nomenclature.

The remark that accuracy of dates seems to be a minor matter with Mr. Distant was an expression of my opinion, founded on solid facts. It will be necessary only to refer to one of Mr. Distant's most recent publications, viz. the 'Fauna of British India'—Rhynchota, vols. i.-iii. (1903-6), and pick out citations at random :—

Leptocorus, Hahn—vol. i. p. 418—(wrongly cited as a synonym of *Serinetha*, which is of later date) was founded 1833, not 1831; many of Hahn and Schäffer's genera in the 'Wanzen-

artigen Insecten' are wrongly dated by Mr. Distant, often by three or four years.

Metacanthus—vol. i. 422—was erected by Fieber, Eur. Hem. 55 (1860), not 213 (1861), and so with most of Fieber's genera cited from this work.

Nabis—vol. ii. 399—was founded 1802, not 1807.

"*Nabis viridulus*, Spin.—ii. 402—was proposed 1837, not 1840, and this applies to other citations of Spinola's 'Essai.'"

"*Aphana pulchella*, Guér."—iii. 203. The text of the 'Coquille' was published in 1838, not 1830.

"*Aphæna variegata*"—iii. 204—should be dated 1833, not 1834.

Polydictya, Guér.—iii. 215. The "texte" of the Icon. Règne Anim. was not published before 1844, probably not till 1845. Mr. Distant cites 1830-4!

The correct dates of these have all been published in the 'Entomologist,' some of them many years ago. I do not expect Mr. Distant to accept without confirmation my notes on dates and synonymy, but if he chooses to disregard them without examination he cannot claim exemption from criticism.

With regard to the classification of the Miridæ (or Capsidæ), it is a pity that Mr. Distant neglected to read the papers he cites.

I did not, as Mr. Distant affirms, propose a new classification, but distinctly stated (Trans. Amer. Ent. Soc. xxxii. p. 117) that the object of my list was simply to enumerate the genera, genotypes, &c., and that it should be considered as a bibliographical contribution. I followed the latest Reuterian system known to me, adding the Hypselœcini, Fulviini, and Clivinemini, founded by Reuter himself, together with seven monotypic tribes whose position was very doubtful. This, according to Mr. Distant, was my new classification! It may be added that—like Reuter and all those, in fact, who have studied the Miridæ—it was the very numerous and very insufficiently characterized genera of Mr. Distant that rendered fuller elaboration impossible.

It was some time after the "list" had passed the final proof—and, indeed, after partial issue as "published"*—that I received Dr. Reuter's classification. I at once studied it, and have come to the conclusion that it is a remarkable piece of work, and probably represents the real classification of known forms very closely, although I recognize that many of the characters used are very subtle, and render the study of this difficult group even harder. Of the fifty-six "addenda and emendanda" made in the 'Canadian Entomologist' (and, through a misunderstanding, also issued in my Separata of the "list," as pp. 156 a-156 b, though I do not think they have been actually published),

* The earlier pages are dated "March, 1906," but I cannot accept this as "publication."

a considerable proportion are minor typographical errors, unfortunately inevitable in papers consisting mostly of names and numbers. Most of the others are inserted to bring the "list" into line, as far as possible, with Reuter's work.*

Regarding *Angerianus*, Mr. Distant is in error; if he will refer to the 'Canadian Entomologist,' p. 374, he will see that I have deleted it from the list of unrecognized genera. Those who have had occasion to wrestle with Mr. Distant's genera will not wonder that I have slipped up occasionally.

I could write a good deal more on this subject, but desire to keep strictly to Mr. Distant's note. Those who are interested in the matter can refer to Reuter's paper ("Hemipterologische Spekulationen, I. Die Klassifikation der Capsiden," in 'Festschrift für Palmen,' no. 1, pp. 1-58 (dated 1905)).

DESCRIPTION OF A NEW SPECIES OF TINGIDIDÆ FROM HONOLULU.

By W. L. DISTANT.

I RECENTLY received four specimens of a Tingid from Mr. Jacob Kotinsky, Assistant Entomologist to the Board of Commissioners of Agriculture and Forestry, Honolulu, with a request that I would identify the species. It had been determined by Mr. Kirkaldy as *Teleonemia bifasciata*, Champ., a species described from Central America; but from this it is quite distinct—by the markings of the elytra, the less prominently curved outer discal carinations of the pronotum, and the shorter apical joint to the antennæ. Under Champion's name it therefore appears in the Entomological Report for 1905 of the Territory of Hawaii. A figure is also given of the species, but in printing the same the dark fasciæ to the elytra have not been reproduced. Mr. Kotinsky states in the above-mentioned Report that it is an introduced insect, and that it "has inflicted terrible injury upon *lantana*."

The following is a description of this Tingid:—

Teleonemia lantanæ, sp. n.

Head, pronotum, antennæ, and body beneath dull fuscous; elytra brownish ochraceous, the discoidal area with two longitudinal piceous or black fasciæ, the innermost broadest and curved, the outermost more slender, straighter, and broken; sutural area with an undulating, oblique, central fascia, and an outer submarginal narrower and more broken fascia, piceous or black; femora fuscous, the tibiæ pale ochra-

* I have no doubt there are other errors of synonymy, &c., yet to be adjusted, and will be obliged to my colleagues for advice of the same.

ceous, with their apices and bases narrowly piceous, tarsi piceous; antennæ moderately stout, first and second joints about equal in length, fourth about as long as first and second united; pronotum prominently palely tricarinate, the lateral margins also carinate; of the three discal carinations, the outermost are only slightly curved, and a little inwardly turned towards base, the interspaces rugulose and finely punctate; elytra long, constricted behind the middle, rounded at apex; costal area with small, distinct, subhyaline, creamy-white areolets, their dividing lines fuscous; sutural area with an apical cluster of creamy-white areolets. Long. $3\frac{1}{2}$ to 4 millim.

Hab. Honolulu, Oahu (J. Kotinsky).

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE RHYNCHOTA.

BY G. W. KIRKALDY.

IN the 'Entomologist' for December (p. 274), Mr. Distant comments upon certain hemipterous genera recently discussed nomenclatorially by me.

The review in 'Nature' of July 5th (lxxiv. p. 220) was the first intimation I received that the third volume of Mr. Distant's work on Indian Hemiptera had been published. The sixth of my bibliographical notes (Entom. 1906, pp. 247-9) was sent away before that, and as, in the 'Entomologist' for January, 1906 (p. 8), Mr. Distant had proposed names for certain preoccupied genera (in the Fulgoroidea) erected by Melichar in 1903, I naturally concluded that the English author had overlooked the preoccupation of "*Kirbya*," about which I had, indeed, written to Melichar in 1904. As it was, I wrote to the Editor, hoping to cancel it, but was too late. My synonymic note on *Coanaco* was also despatched before Mr. Distant's correction was published. These matters are, of course, of trivial importance, and, indeed, inevitable where two or more workers are traversing parts of the same ground.

The discarding of *Opinus* (even if possible, which I do not admit) would not render *Sminthocoris* valid, as *Tapeinus* would still be available.

I was quite aware of the existence of *Penthicodes*, which is a strict synonym of *Aphæna*. It was not founded for a special type, but expressly to replace the preoccupied *Penthicus*, which also was expressly erected to replace *Aphæna*, which was supposed to be preoccupied by *Aphanus*. The types of *Aphæna*, *Penthicus*, and *Penthicodes* are therefore one and the same, as indicated already.

ON SOME NEW CENTRAL AMERICAN VESPIDÆ.

BY P. CAMERON.

ZETHOIDES, Cam., *non* Fox.

The name of this genus I changed into *Plesiozethus* in the 'Entomologist,' 1904, p. 269. Mr. Albert Schulz, not being aware of this, has proposed for it, in his laborious work, 'Spolia Hymenopterologica,' p. 213, 1906, the name of *Metazethoides*, which is, of course, useless.

Zethus (Didymogastra) lamellicollis, sp. nov.

Black, densely covered with fulvous pubescence; the clypeus, mandibles, except the apex and lower edge, under side of antennal scape, two small spots over the antennæ, a line behind the raised keel of pronotum, a small spot on the sides of scutellum, two lines on centre of post-scutellum, two longish pyriform marks (the narrowed end above) on the metanotum, a broad line on the sides of apex of abdominal petiole, with an oblique incision on the apex above and continued as a broader mark, narrowed on the inner side to near the middle of the segment above, and lines on the apices of the second to fifth segments, and a curved spot (the narrowed end at the base) on the apex of the petiole of second segment, bright lemon-yellow; the apical half of anterior femora, the middle in front, the apex of the hinder below, and the tibiæ except behind of a paler yellow colour. Flagellum of antennæ orange-yellow below towards the apex. Wings hyaline, suffused with fuscous, the nervures and stigma black. ♂. Total length, 17 mm.

North Mexico.

Antennæ with a stout hook, narrowed towards the apex. Clypeus wider than long, its apex black, and bearing two short, black, widely separated teeth; the punctuation is distinct, but not very strong or close. Mandibles with three teeth, the basal two shorter and blunter than the apical. Front and vertex closely, strongly punctured; the temples broad, roundly narrowed, the occiput sharply keeled. Ocelli in an equilateral triangle, the latter separated from each other by the same distance they are from the eyes. Base of thorax raised into a transverse plate, which forms a furrow with the part behind, and is continued along the pronotum to near the tegulæ, this lateral plate becoming shorter towards the apex. Mesonotum strongly, closely punctured, more closely on the basal than on the apical half; the former has a keel down the middle. Scutellum more shining and less pilose than the mesonotum; its punctures are more widely separated; it is not raised above the mesonotum. Post-scutellum rounded, broadly narrowed towards the apex; strongly punctured and covered with long hair. Metanotum with a rather steep slope, stoutly, obliquely striated. Propleuræ smooth, the mesopleuræ rather strongly punctured; the metapleuræ opaque, obscurely striated. Abdominal petiole smooth, shining, as long as the thorax, the basal third narrowed, the rest forming an elongated oval, depressed above at the apex; the

second segment with a narrow, cylindrical petiole, fully half the length of the rest, which forms a triangle, transverse at the apex, where there is a row of large punctures; the second margin is strongly reflexed; the apical half of the segment sparsely, weakly punctured, the following three segments are more coarsely and closely punctured. Tegulæ black, yellow at base and apex.

Comes nearest apparently to *Z. chicotencatl*, Sauss., the male of which is unknown. It belongs to Saussure's Section B. of *Didymogastra*, which contains only South American species up till now.

Zethus (Didymogastra) claripennis, sp. nov.

Black, densely covered with a grey pile; a broad band on the apex of the clypeus (almost the apical third), a line on apex of pronotum, two squarish spots on apical half of scutellum, two large marks on apex of metanotum, straight on inner side, rounded and narrowed on outer side, a line on the apex of first abdominal segment above, a broader, more irregular mark on the apical third of the sides, its base narrowed, a line on the apical two-thirds of the base of the narrowed part of the second segment, and a line round the apex of the latter, bright lemon-yellow. Apical joints of antennæ pale orange below. Wings hyaline, iridescent, the nervures and stigma black. ♂. Total length, 14 mm.

North Mexico.

Antennæ ending in a thickened spiral. Clypeus not much wider than long, densely pilose, weakly, sparsely punctured, the punctures hid by the dense white pile; the apex with a short blunt tooth on either side of the centre. Front and vertex rugosely punctured; the ocelli almost in a curve, the hinder separated from each other by about the same distance they are from the eyes. Mandibles ending in two teeth, the apical much larger than the basal. Mesonotum closely, regularly, rather strongly punctured, without keels or furrows. Scutellums more shining and less closely punctured, the apex of post-scutellum broad. Metanotum obliquely sloped, depressed in the middle, irregularly, transversely striated. Abdominal petiole longish pyriform, two-thirds of the length of the thorax, not much narrowed at the base, the top weakly, the sides more strongly punctured. The narrowed base of the second segment is one-fourth of the length of the rest, which forms a triangle, not much longer than it is wide at the apex, which is flat, weakly punctured; the second border broad, reflexed. The thorax is not quite twice longer than wide, almost transverse at the base, where there is a reflexed margin; the apex becomes gradually narrowed from the base towards the apex.

Zethus (Didymogastra) fulvo-hirtus, sp. nov.

Black; the top of the head and of the thorax densely covered with fulvous pubescence; the pubescence on the rest of the body not so dense, and paler; the first abdominal segment almost bare, the second covered with a pale fulvous pile; the under side of the antennal scape, the raised base of thorax, a small spot on the sides of scutellum, an interrupted line on the post-scutellum, two longish broad marks on the metanotum, straight on the inner side, rounded and narrowed on the

outer, a bifid mark, broad and rounded on the inner, longer and narrower on the outer sides on the apex of the first abdominal segment, and narrow lines all round the apices of the second to fifth abdominal segments, bright lemon-yellow. Flagellum at the base and apex below dark brown. Wings hyaline, very iridescent, narrowly smoky along the fore margin. ♀. Total length, 16 mm.

Nicaragua.

The narrowed basal part of the abdominal petiole is about one-fourth of the whole; it becomes gradually thickened above and laterally; the apex is depressed above; the narrowed base of the second is a little more than one-fourth of the whole. The first and second are impunctate, except the apex of the latter, where there is a punctured belt. The third, fourth, and fifth segments are strongly punctured. The pronotal crest is conspicuous, and extends almost half-way down the sides. Mesonotum and scutellums smooth, shining, except the part at base of scutellum, which is strongly striated. Centre of metanotum strongly striated, the top lateral angles as strongly, obliquely striated, the striae twisted; there is a stout keel down its centre. Mesopleurae strongly, closely punctured, the pro- and meta-pleurae smooth. Front and vertex rather strongly and closely punctured; the ocelli in a triangle, the hinder separated from each other by a greater distance than they are from the eyes; they are placed opposite the end of the eyes. Clypeus rounded, its apex broad, clearly separated, transverse, smooth, shining, the shining part broader in the middle. Temples roundly, obliquely narrowed. There is a stout keel down the basal half of the mesonotum, it being bordered by a shorter, thinner one on the base. The four anterior tibiae are yellow in front, and there is a narrow yellow line on the outer edge of the hinder; the apex of fore femora narrowly, of the middle more broadly, yellow. Mandibles with two broad apical teeth. Scutellum flat. The second lamina of second abdominal segment is narrow, distinctly reflexed. The post-scutellum becomes gradually narrowed towards the apex.

Allied to *Z. chicotencatl*, Sauss., and *tubulifer*, Sauss., from Mexico.

(To be continued.)

NOTES AND OBSERVATIONS.

THE ENTOMOLOGICAL CLUB.—A meeting of this old-established Club was held on January 22nd last, in the Entomological Salon, Holborn Restaurant. Mr. G. H. Verrall in the chair. Members and invited guests began to assemble soon after 6.30 p.m., and by 8.30 p.m.—at which time supper was served—there were over seventy present. Supper being over, Mr. Verrall first proposed the toast of “The King,” and afterwards that of “The Entomological Club.” In moving the latter, he adverted to the fact that having been elected a member of the Club in 1887, it was the twenty-first occasion on which it had been his privilege and pleasure to occupy the chair. He also remarked that although membership of the Club was limited to eight, still they could elect honorary members, and that these would be eligible in their turn to fill up such vacancies as might occur on the

roll. Touching on the subject of the property of the Club in the shape of its collections of insects, he stated that he had lately seen these, and noted that the specimens therein were in good order, and well cared for by Mr. Lowne, the curator, in whose possession they still remained. The delightful violin solos by Mr. Jacoby greatly augmented the pleasure of the evening.

LAPHYGMA EXIGUA.—On August 25th last I took a specimen of this insect on a gas-lamp near Poole, Dorset, and two days later, when out with Mr. W. G. Hooker, of Bournemouth, we captured a second, on a lamp at the same place. As the first specimen was a female I kept it alive, and on the night of August 26th it laid about a hundred and twenty-five ova in a chip-box. I kept about seventy-five of these, and they emerged on August 31st. The young larvæ fed up easily on dock, and commenced to pupate at the end of September, the perfect insects emerging at the end of October and beginning of November, with the aid of a little artificial heat. I bred forty-four perfect specimens, but the percentage bred would no doubt have been larger but for the fact that I had to disturb the larvæ just as they were spinning up, so that several died in pupating. The moths are quite handsome little insects, the markings on the fore wings being very rich, and they vary considerably in the intensity of the markings, one or two of the specimens being very dark indeed.—WILLIAM J. OGDEN; 1, West Bank, Stamford Hill, N., London, February 18th, 1907.

THE first volume of Mr. J. W. Tutt's 'Natural History of the British Butterflies' is announced for immediate publication by Mr. Elliot Stock. It is intended as a text-book for students and collectors, and deals with the world-wide variation and geographical distribution of butterflies. It will be very fully illustrated by photographs from nature.

CAPTURES AND FIELD REPORTS.

DAPHNIS (CHEROCAMPA) NERII AT LANCASTER.—I beg to report the capture, at Lancaster, of the oleander hawk-moth (*C. nerii*) on September 18th, by one of Lord Ashton's workmen. It was taken at rest on one of the buildings inside the works, and the man who caught it kept it in a box for two days, and then a friend of mine, Mr. James Stalker, got the moth and brought it to me to set. It was in very fair condition considering its captivity. Can you give me any data when *C. nerii* was last caught in England?—G. RALPH; 4, Albert Road, Skerton, Lancaster.

[There are seven records in the 'Entomologist' of the capture of *C. nerii* in Britain during the past ten years. The dates are:—1896: one specimen at Sowling, Kent, captured in a house, end of July. 1900: one in a dining-room at Yalding, Kent, September 18th; and one in Teignmouth, October 23rd. 1901: one at Barrhead, Scotland, end of September (?1900), on a sheaf of corn. 1903: one at rest on a yew-hedge in a garden outside Atherstone, Warwickshire, October 9th. At a meeting of the Lancashire and Cheshire Entomological Society, held on November 16th, 1903, a specimen found on board a steam-

ship at Liverpool was exhibited. 1904: one specimen was captured as it rested on a bathing-machine at Eastbourne, July 14th. Earlier records will be found, Entom. xxiv. pp. 195, 221. The finding of two larvæ of this species at Eastbourne in October, 1859, was reported in the 'Entomologists' Weekly Intelligencer,' vol. xii. p. 140. These died, and one is led to suspect, from the particulars given, that the larvæ were probably those of *S. convolvuli*, which species was fairly common in England in 1859, and its larva was recorded from Devonshire in October of that year.—ED.]

LESTES DRYAS, Kirb., IN IRELAND.—Mr. H. M. Edelsten informs me that he has had specimens of this somewhat rare British dragonfly sent him from Ireland. They came from Caragh Lake, Co. Kerry. and were taken early in September, 1906. The only other Irish record seems to be that of the capture of a specimen near Athlone in 1894, by Mr. J. J. F. X. King.—W. J. LUCAS.

PLUSIA MONETA IN NORTHAMPTONSHIRE.—In my note on *P. moneta* (ante, p. 40) the county should be Northamptonshire, not Nottinghamshire.—F. J. RASELL; Theedon Road, Northampton.

A FORTNIGHT IN CUMBERLAND.—In July, 1906, my friend Mr. A. E. Gibbs, of St. Alban's, very kindly asked me to spend my fortnight's holiday at St. Bees, Cumberland, where he had taken a house for part of the summer. Unfortunately it was unsettled and wet most of the time, so that we were unable to do as much with the butterflies as we could have wished. Although we kept a sharp look-out around St. Bees, and also in Eskdale (which we visited several times) and in Wastdale, for the *Erebias* and *Canonympha darus*, we did not see a specimen of either. *Satyrus semele* was fairly common on St. Bees Head, and along the coast towards Nethertown. The majority of the specimens are of the dark "heath" form, but the males vary *inter se* in the amount of tawny colour on the upper side of the hind wings. I have one male which has three spots on the upper side of the fore wings, the extra ones being unocellated and just below the normal lower spot, and there is an extra dot on the right fore wing just above the lower normal spot. We also took several females which have extra spots between the normal ones. The females of *Lycana icarus* have the orange spots well developed both on the upper and under sides, and are slightly suffused with blue on the upper side. Nearly every evening we indulged in sugaring in a lane running past the house down to the shore, where there were many convenient posts. The best species taken were *Mamestra furva* and *Noctua umbrosa*, the former of which we secured in some number, but the majority were worn. *Xylophasia lithoxylea* and *X. monoglypha* swarmed, and the latter varied to a remarkable degree—from the colour of the darkest brown velvet, practically black, through intermediate forms to the type. One of the lighter forms is particularly beautiful, being of a mottled appearance with an almost white patch on the inner margin of the fore wings, and a very dark area in the middle of the wing just below the discoidal spots. Several other species varied towards darker forms, viz., *Leucania conigera*, *L. lithargyria*, *Axylia putris*, and *Hadena dentina*, and Mr. Gibbs obtained a nice female of *Agrotis exclamationis*, which is very dark and has the markings coalesced into an irregular patch. One or two even-

ings we tried dusking in the lanes, but only obtained a few species, including *Hepialus humuli*, *H. velleda*, *Dianthæcia capsicola*, *D. cucubali*, several *Plusias*, *Gnophos obscuraria*, &c. We had one rather exciting evening's sugaring at Eel Tarn, in Eskdale. This is a small lake about eight hundred feet above sea-level, lying amongst the hills to the north of the 'Woolpack Inn' at Boot, and is surrounded by a "sheep-fence" formed of posts about four feet high, supporting wire netting with barbed wire running along the top. As the wire netting had been fastened on the outside of the posts, we were obliged to get over in order to spread the sweets, and found the ground was extremely wet and spongy. After dark it was very difficult to pick one's way between the bog-holes, and before long both of us went into water up to our knees. I also managed to gouge a piece out of my hand on the barbed wire. To add to our discomfort it turned out a wet evening, and a thick mist came down, so that we should have had some difficulty in finding our way back, had we not taken one of the men from the inn as our guide. The bag was a poor one, only *Noctua festiva*, and one or two dark *Hadena pisi* and *H. thalassina* being taken; but *Phryganea varia* swarmed on every post. On the way up we took one or two *Hepialus velleda* just before dusk, flying amongst bracken, and previously we had captured a few *Crambus margaritellus* on the edge of the lake. We found only one *Larentia cæsiata*, resting on a rock at about a thousand feet on the hills opposite Boot, and a few *Mixodia schulziana*.

With the kind assistance of Rev. E. N. Bloomfield we have been able to name the following Diptera of those taken:—*Tipula scripta*, female (Eskdale); *Thereva nobilitata* (St. Bees); *Chilosia illustrata*, abundant in places on railway bank at St. Bees; *Syrphus albostrigatus* and *S. ribesii*; *Volucella bombylans*, *Eristalis arbustorum* (these four species at St. Bees); *Xylota segnis* (Eskdale).

Amongst the Hymenoptera I captured a male *Cilissa leporina*, the identification of which has been confirmed by Mr. Edward Saunders. I do not think this species is often taken so far north, as all the localities given in Mr. Saunders's book are in the southern and eastern counties.

Of the Neuroptera taken may be mentioned *Panorpa germanica*, of which we obtained some strongly marked specimens at the foot of Hardknot Pass.

The following is a list of all the Lepidoptera observed, St. Bees being the locality unless otherwise stated:—*Argynnis aglaia*, *Satyrus semele*, *Epinephele janira*, *E. tithonus*, *Canonympha pamphilus*, *Polyommatus phleas*, *Lycæna icarus*, *Zygæana filipendule*, *Nudaria mundana*, *Hepialus humuli*, *H. velleda* (and at Eskdale), *Odonestis potatoria*, *Leucania conigera*, *L. lithargyria*, *Axylia putris*, *Xylophasia lithoxylea*, *N. monoglypha*, *Charæas graminis*, *Cerigo matura*, *Mamestra sordida* (Eskdale), *M. furva*, *M. brassicæ*, *Apamea basilinea*, *A. didyma*, *Miana strigilis*, *M. fasciuncula*, *M. literosa*, *Caradrina morpheus*, *C. alsines*, *C. taraxaci*, *C. quadripunctata*, *Agrotis segetum*, *A. exclamationis*, *Noctua plecta*, *N. c-nigrum*, *N. festiva*, *N. rubi*, *N. umbrosa*, *N. baja*, *N. xanthographa*, *Triphana orbona*, *T. pronuba*, *Amphipyra tragopogonis*, *Miana typica*, *Dianthæcia capsicola*, *D. cucubali*, *Euplexia lucipara*, *Aplecta nebulosa* (Eskdale), *Hadena dentina*, *H. oleracea*, *H. pisi* (Eskdale),

Cucullia umbratica, *Habrostola tripartita*, *Plusia chrysitis*, *P. iota*, *P. pulchrina*, *P. gamma*, *Hypæna proboscidalis*, *Crocallis elingvaria*, *Boarmia repandata*, *Gnophos obscuraria*, *Acidalia dimidiata*, *A. marginepunctata*, *Strenia clathrata*, *Panagra petraria*, *Abraxas grossulariata*, *Larentia didymata*, *L. castata*, *Emmelesia alchemillata* (Eskdale), *E. albulata*, *E. decolorata*, *Eupithecia nanata*, *Hypsipetes sordidata*, *Melanthia ocellata*, *Melanippe sociata*, *M. montanata*, *M. galiata*, *Camptogramma bilineata*, *Cidaria populata*, *C. associata*, *Eubolia limitata*, *Tanagra atrata*, *Scoparia ambigua*, *S. dubitalis*, *S. cratægella*, *Scopula lutealis*, *Pioneer forficatis*, *Hydrocampa nymphæata*, *Crambus margaritellus*, *C. perlellus*, *C. tristellus*, *C. culmellus*, *Aphomia sociella*, *Tortrix podana*, *T. ribeana*, *Dictyopteryx læflingiana* (Eskdale), *D. holmiana*, *Mixodia schulziana* (Eskdale), *Ephippiphora trigeminana*, *Catoptria hypericana* (Eskdale), *C. cana*, *Trycheris aurana*, *Xanthosetia zœgana*, *Conchylis straminea*, *Depressaria flavella*.—PHILIP J. BARRAUD; Bushey Heath, Herts, February 12th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, February 6th, 1907.—Mr. C. O. Waterhouse President, in the chair. The President announced that he had nominated Mr. Frederick Merrifield, Mr. Edward Saunders, F.R.S., F.L.S., and Mr. George Henry Verrall, to be Vice-Presidents for the session 1907–8. Mr. Charles Kimberlin Brain, of 23, Burnside Road, Tamboers Kloof, Cape Colony; Mrs. Catharine Maria Moore, of Holmefield, Oakholme Road, Sheffield; and Mr. Alfred Ernest Tonge, of Aincroft, Reigate, were elected Fellows of this Society.—Mr. E. A. Cockayne brought for exhibition, a collection of Lepidoptera made by him at Tongue, North Sutherlandshire, between June 30th and July 13th, 1906, comprising many species not hitherto reported from the county. It was noticeable that the several species showed little tendency to melanism.—Dr. T. A. Chapman, exhibited bred specimens of *Hastula hyerana*, Mill., from the neighbourhood of Hyères, to illustrate how the species varied. One or two, especially the two darkest December males, strongly suggested that the darkening of the colour of the wings was due to injury by cold, not to a more perfect, because prolonged, maturation.—Miss M. E. Fountaine, a number of Anthocarid and Melitæid butterflies from various localities in Europe, Asia Minor, and Algeria, showing a wide range of variation.—The President, a female example of the genus *Dorylus*, from Mengo, in Uganda. There were with it in the same tube one small and two large Workers, which he thought would probably be the means of identifying the species at some future time. The Workers closely resembled specimens in the Museum named *D. arcens*, which are said to be the same as *nigricans*.—The Rev. F. E. Lowe showed various aberrant forms of Swiss butterflies, including *Melanargia galatæa* ab. *fulvata*, Lowe, from Martigny; an example of *Lycæna arion*, from Pontresina, with the black markings on the under side of the wings almost entirely absent, save one very large kidney-shaped spot, slightly tinged with white at the centre of each wing; and a pair of *Pieris napi* var. *bryoniæ* taken in cop. at Caux; the male

not only suffused as in *bryonia*, but also having the female markings.—Colonel Charles T. Bingham exhibited the pupa of a Tineid moth, of the genus *Brinsitta*, from Upper Burma, presenting with its surroundings a remarkable mimetic resemblance to the head and neck of a snake; and a case illustrating the curious habits of the butterflies of the genus *Gerydus* and *Allotinus*, which join with ants in attending Aphidæ for their sweet excretions.—The Rev. F. D. Morice, a very remarkable gynandromorphous specimen, from Silchester, of the common fern-visiting saw-fly, *Strongylogaster cingulatus*, F.; the dividing line between the male and female portions running longitudinally, not transversely, from end to end of the creature, a characteristic in the opinion of the President, unique.—Mr. Percy L. Lathy, F.Z.S., communicated “Notes on the Indo-Australian Papilionidæ”; and Mr. Ernest A. Elliott, F.Z.S., and Mr. Claude Morley, a paper “On the Hymenopterous Parasites of Coleoptera.”—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Thursday, January 24th, 1907.*—Mr. R. Adkin, F.E.S., President, in the chair. — *Annual Meeting*: the Treasurer’s balance-sheet was read, and showed that the Society was satisfactory financially. The Council’s Report of the condition and progress of the Society was then read, and showed that its position of usefulness was still maintained. The President then read his Annual Address, including in it remarks on the progress of entomology generally during the past year. Votes of thanks were unanimously passed to the retiring Officers and Council. The following is a list of those gentlemen elected to serve as Officers and Council for the ensuing year:—President: R. Adkin, F.E.S.; Vice-Presidents: W. J. Kaye, F.E.S., and H. Main B.Sc., F.E.S.; Treasurer: T. W. Hall, F.E.S.; Librarian: A. W. Dods; Curator: W. West (Greenwich); Hon. Secretaries: Stanley Edwards, F.L.S., F.Z.S., and Hy. J. Turner, F.E.S.; Council: F. B. Carr, T. A. Chapman, M.D., F.Z.S., F.E.S., A. Harrison, F.L.S., F.Z.S., F.E.S., A. L. Rayward, F.E.S., A. Sich, F.E.S., R. South, F.E.S., and E. Step, F.E.S.

Ordinary Meeting.—Miss Margaret Fountaine, F.E.S., of West Hampstead, was elected a member.—Messrs. Harrison and Main exhibited a series of *Boarmia repandata*, mainly from Isle of Man parents, with series from Cornwall, Delamere, and Isle of Lewis; and contributed notes on their occurrence and variation. The captured Isle of Man specimens were taken from off rocks.—Mr. Main, a living larva of *Charaxes jasius*, received from the South of France, and called attention to its wonderful protective coloration, shape, and to the fact that the curious mask of the head is shed as a whole.—Hy. J. TURNER, *Hon. Report Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*January 21st, 1907.*—Mr. G. T. Bethune-Baker, President, in the chair. — Mr. J. T. Fountain showed a beautifully varied series of *Hybernia defoliaria*, Cl. It included specimens almost unicolorous, of a dark umber colour; others with the same dark umber as a ground colour, with dark bands or bars, in some cases broad, dark, nearly black, and sharply defined; then there were the usual light brown forms; the usual ones with light ground and cross bars, amongst which were some with clearly defined, broad, almost black bars.—Mr. Hubert Langley exhibited various

Lepidoptera from near Leamington, including *Lymantria monacha*, L., not uncommon, *Boarmia roboraria*, Schiff., *Myelois cribrella*, Hb., &c. —Mr. L. Doncaster made an appeal for help in connection with the Royal Society's enquiry into progressive melanism.—Mr. W. E. Colling showed an unidentified dipterous larva, which had been sent to him as destructive to currant bushes, but which he thought were only accidentally associated with them.—Mr. G. T. Bethune-Baker, a beautiful lot of Pieridæ of the genus *Delias*, from New Guinea and the Australian region, including several new species.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Catalogue of the Lepidoptera Phalaenæ in the British Museum. Vol. VI. By Sir GEORGE F. HAMPSON, Bart. Pp. i-xiv, 1-532. With Atlas of twelve plates in colour. London: Printed by Order of the Trustees. 1906.

EIGHT years ago the first volume of this comprehensive and elaborate work was reviewed in the 'Entomologist,' and vol. vi. is now before us. Although entitled a Catalogue, each volume is not simply a list of names and references, but practically a monograph of the family or subfamily with which it is concerned. Every species is described, and figured also where this has not been adequately done before.

In the present volume the Cucullianæ, the third of the fifteen subfamilies into which Sir George Hampson divides the family Noctuidæ, is dealt with. This subfamily, "characterised by its trifid neuration of the hind wing combined with spineless tibiæ and smooth eyes surrounded by eye-lashes of bristle-like hairs," comprises 692 species belonging to 111 genera.

Associated with the key to genera (pp. 2-7) is a table showing the Phylogeny of the Cucullianæ. Following the diagnosis of each genus is a key to the species belonging to that genus.

Twenty-three genera comprise more than six species each, and the largest of these are *Cucullia*, Schrank (101 sp.); *Empusada*, Hmps. (12 sp.); *Oncocnemis*, Led. (57 sp.); *Homohadena*, Grote (12 sp.); *Graptolitha*, Hb. (48 sp.); *Antitype*, Hb. (20 sp.); *Bryomima*, Staud. (12 sp.); *Trichoridia*, Hmps. (10 sp.); *Conistra*, Hb. (33 sp.); *Amathes*, Hb. (30 sp.); and *Cosmia*, Ochs. (25 sp.).

Thirty-six genera each include but a single species, and of these the following are new:—*Neogalea* (t. *braziliensis*, sp. n.); *Brachygalea* (t. *leucorhabha*, sp. n.); *Cheliogalea* (t. *scoparia*, Dorf. m.); *Argyroalea* (t. *argentea*, Hufn.); *Argyromata* (t. *splendida*, Cram.); *Opsigalea* (t. *oceliata*, Walk.); *Harpagophana* (t. *hiaris*, Staud.); *Ammetopa* (t. *codeti*, Oberth.); *Protophana* (t. *cervina*, H. Edw.); *Rhodochlana* (t. *botonga*, Feld.); *Andesia* (t. *anistis*, sp. n.); *Ectocheila* (t. *canina*, Feld.); *Homoneocnemis* (t. *fortis*, Grote); *Copitype* (t. *pagoda*, Alph.); *Caffristis* (t. *ferrogrisea*, Hmps.); *Dryotype* (t. *opina*, Grote); *Xylo-type* (t. *capax*, Grote); *Neunichtis* (t. *trijuncta*, Walk.); *Hypnotype* (t. *placens*, Walk.); *Elvesia* (t. *diplostigma*, Hmps.); *Rhynchaglaea* (t. *scitula*, Butl.); *Grammoscelis* (t. *leuconeura*, sp. n.); *Omphaloscelis*

(*t. lunosa*, Haw.); *Austramathes* (*t. purpurea*, Butl.); *Brachycosmia* (*t. digitalis*, Grote).

In *Cucullia*, Schrank (*t. artemisiæ*), are included *Eudercæa*, Hb. (*t. asteris*), *Eucalimia*, Hb. (*t. gnaphalii*), *Callænia*, Hb. (*t. umbratica*), *Argyritis*, Hb. (*t. artemisiæ*), and *Rancora*, Smith (*t. strigata*).

Croceago, Schiff., which is the type of *Lampetia*, Curtis, and *Hoporina*, Blanch., is fixed by Sir George Hampson as the type of *Xantholeuca*, Steph. (1831). *Jodia*, Hb., to which Stephens referred *croceago* when sinking *Xantholeuca* (Brit. Mus. Cat.), is here reserved for the North American *rufago*, Hb., the type and only species.

Of the ten species included by Staudinger (Cat. Lep. Pal. 3rd ed., p. 177) in *Heliophobus*, B., four are here placed in *Leucochlænæ*, a new genus, of which *hispida*, Geyer, is the type; three other species are referred to *Blepharidia*, Püngler, and one to *Ulochlænæ*, Led. The remaining two seem not to belong to the *Cucullianæ* at all.

Bombycia, Hb., Tent., is rejected, and Stephens's genus of that name is used for *viminalis*, Fab. (the type), and three other species.

Satura, Schiff., *adusta*, Esp., and *protea*, Schiff., are associated with *lichenea*, Hb., in *Eumichtis*, Hb., of which genus the last-named species is fixed as the type. *Protea* (*seladonia*, Haw.) was first referred by Stephens (Haust. iii. 33) to *Polia*, and afterwards (Brit. Mus. Cat.) placed in *Dichonia* (*Hadena*, Sect. D.); Staudinger and others have included *protea* in *Dryobota*, Led. Sir George Hampson, however, gives *areola*, Esp., as the type of *Dichonia*, Hb., and *jurva*, Esp., as the type of *Dryobota*, Led.

The following list of fifty British species included in *Cucullianæ* is drawn up to show not only generic changes, but also the order in which they occur in the arrangement; the number after each name refers to the page in the volume. The genus *Cucullia* has been previously adverted to, so will not be further mentioned:—

Leucochlænæ, Hampson, g. n., *hispida*, Geyer (Hübner), 133. Type.

Four other species.

Brachionycha, Hw., *sphinx*, Hufn., 202. Type of *Asteroscopus*, Boisd., and of *Petasia*, Steph.

B. nubeculosa, Esp., 203. Type.

Bombycia, Steph., *viminalis*, Fab., 219. Type. Also of *Cleoceris*, Boisd. (1840).

Aporophylla, Guen., *lutulenta*, Schiff., 235.

A. australis, Boisd., 237. Type.

A. nigra, Haw., 238.

Cloantha, Guen., *solidaginis*, Hübner, 239. Type.

Lithophane, Hb., *semibrunnea*, Haw., 244.

L. socia, Rott. Type.

Graptolitha, Hb., *ornithopus*, Rott., 258.

G. lambda, Fabr., 259. Type *Rhizolitha*, Curtis (1833).

G. furcifera, Hufn., 261. Type.

Xylina, Ochs., *vetusta*, Hb., 281. Type.

X. exoleta, Linn., 285. Type of *Axylia*, Hb., and of *Calocampa*, Steph.

Dichonia, Hb., *areola*, Esp., 294. Type. Also of *Xylocampa*, Gn. (1837).

- Meganephria*, Hb., *oxyacantha*, Linn., 306. Type. Also of *Miselia*, Hb., Tent., ined.
- M. bimaculosa*, Linn., 309.
- Agriopis*, Boisd., *aprilina*, Linn., 318. Type. Also of *Diphthera*, Hb., Tent., ined.
- Eumichtis*, Hb., *lichenæa*, 321. Type. Also of *Epunda*, Dup.
- E. saturæ*, Schiff., 327.
- E. adusta*, 329.
- E. protea*, Schiff., 339.
- Valeria*, Steph., *oleagina*, Schiff., 348. Type.
- Antitype*, Hb., *flavicincta*, Schiff., 361. Type of *Polia*, Hb., Tent., ined.
- A. nigrocincta*, Treit., 369.
- A. chi*, 372. Type.
- Rhizotype*, Hmps., *flammea*, Esp., 373, = *emphyrea*. Type. Six other species.
- Dasypolia*, Guen., *templi*, Thunb., 424. Type.
- Eupsilia*, Hb., *satellitæa*, Linn., 437. Type.
- Xantholeuca*, Steph., *croceago*, Schiff., 441. Type.
- Conistra*, Hb., *erythrocephala*, Schiff., 449.
- C. raccinii*, Linn., 454. Type of *Gleæ*, Hb., Tent., ined.
- C. ligula*, Esp., 455.
- C. rubiginea*, Schiff., 457. Type of *Dasycampa*, Guen.
- Omphaloscelis*, Hampson, *lunosa*, Haw., 469. Type and only species.
- Amathes*, Hb., *lychnidis*, Schiff., 475, = *pistacina*, Schiff., type of *Agrochola*, Hb., which is included in *Amathes*.
- A. lota*, Linn., 478.
- A. macilenta*, Haw., 479.
- A. circellaris*, 480. Type of *Rusina*, Steph., which is merged in *Amathes*.
- A. helvola*, Linn., 482.
- A. litura*, Linn., 483. Type.
- A. iners*, Germ., = *suspecta*, Hb., 487. Type of *Dyschorista*, Led.
- Atethmia*, Hb., *xerampelina*, Esp., 494. Type. Also of *Cirrædia*, Guen.
- Cosmia*, Ochs., *aurago*, Schiff., 498. Type of *Ochria*, Hb.
- C. lutea*, Ström. = *flavago*, Esp., = *silago*, Hb., 501.
- C. fulvago*, Linn. = *cerago*, Schiff., 502. Type. Also of *Citria*, Hb., and *Xanthia*, Hb., Tent.
- C. gilvago*, Schiff., 503.
- C. ocellaris*, Borkh., 505.
- C. citrigo*, Linn., 508. Type of *Cirrhiæ*, Hb.

We may mention that there are three hundred and fifty-four figures on the twelve plates in the Atlas which accompanies this volume, and that there are systematic and alphabetical Indexes.

It is perhaps needless to say that Catalogues such as the one under notice are of paramount utility and importance, as this must be obvious when their scope is understood. In the volumes previously issued, all the known species (up to date of publication) are brought together of the Syntomidæ (vol. i.), Arctiadæ (vols. ii. and iii.), Noctuidæ-Agrotinæ (vol. iv.), and Hadeninæ (vol. v.).

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LEAF-INSECTS IN CAPTIVITY. (*PULCHRIPHYLLIUM CRURIFOLIUM*, SERVITH.)

By W. H. ST. QUINTIN, F.E.S., &c.

TOWARDS the end of May, 1906, I was given some thirty or forty ova of a *Phyllium* which had been found by a friend who was cruising with Lord Crawford, on the yacht 'Valhalla,' last winter and spring. A good many of the perfect insects and a few larvæ had been collected on the island of Mahé (Seychelles group), and carried on the yacht with great care, and very considerable trouble. A cabin, electrically heated, was set apart for them, and branches of the food-plant (wild guava) provided. The food caused a difficulty, for the branches taken on board were soon eaten, and no more could be obtained till Cairo was reached, and a fresh supply brought on board from the Giza Gardens. In the end thirteen were safely landed, and were on view in the Insect House at Regent's Park for some weeks afterwards. Ova were laid freely on the yacht. Some were left with Captain Stanley Flower at Cairo, others were presented to the Zoological Society, while I was fortunate enough to be entrusted with the remainder.

What happened to those left at Cairo I never heard, but the ova deposited at the Zoological Gardens hatched, but I believe they did not live long. Luckily, I was lent a copy of the 'Bulletin de la Société Vaudoise,' in which Mons. Morton relates how in 1903 he reared from the egg another species collected in Ceylon (*P. scythe*). Otherwise I should never have realized the necessity of providing so much moisture as well as heat that the insects evidently require.

Following Mons. Morton's methods, I placed my ova on silver-sand in a box, over which a piece of muslin, doubled, and kept saturated, was stretched. The box and its contents were sprayed with a fine garden syringe twice a day, and stood in a small stove where the temperature was kept at a high level,

and the atmosphere as near saturation-point as possible, to suit *Phalænopsis* and other heat and shade-loving orchids. The temperature has varied night and day between 70° and 85° Fahr.

The first larva did not appear until the last week of August, and they continued hatching until the end of the year, though mostly in September and October; but two larvæ appeared in December, and one of the last remaining ova hatched on January 8th. This irregularity seems strange, for the ova were all deposited between the 7th April and the 15th May. That this is the case sometimes with these insects in the wild state is shown by the fact that on the islands, amongst the adults, were found, as I have said, a few examples in the early larval stages.

The ovum bears a general resemblance to those of the *P. scythe* figured in the 'Bulletin' referred to, and is wonderfully like the seed-capsule of certain flowering plants, as Mons. Morton remarks. The wall of the ovum is rough in texture, and of an umber-brown colour, as is the characteristic lid or stopper, which is pushed off by the young larva as it emerges.

The larva when newly hatched is of a pale amber colour, streaked and splashed with dull rose. It is lively, and moves with a curious swinging action, which is exaggerated when the insect is alarmed [as in the case of the young *Mantis*, and also the young "stick-insect" (*Bacillus*)], and which may be intended as a menace.

At this tender stage, the only losses up to the present time occurred—one larva getting crushed by the lid of the cage, while two others were killed and sucked dry by some small spiders which managed to get through the perforated zinc. I found the larvæ soon took to the beech-leaves, which, following the example of Mons. Morton, I offered them. As the season advanced, and it became difficult to find fresh beech foliage, I got the insects to take to that of the common oak, with a little unwillingness on their part; and later on to some young bushes of *Q. ilex*, which seems to satisfy them completely. Probably there will be no necessity again to unsettle them, as I have a good supply of plants, and I find that the *ilex* stands the heat and damp of the stove well enough.

I have found it impossible to note the periods of skin-casting exactly, as the larvæ are of such different ages. Besides, their extraordinary similarity to the *ilex* leaf makes close observation difficult. But my gardener, F. Puddle, who has had the insects from the first constantly under his eye, and to whose care any credit for success is due, believes that the largest individuals (females), now 2½ in. long, have in the twenty-one weeks up to the present date (February 4th) changed their skins eight or nine times.

The larvæ after each change devour the shed skin immedi-

ately, or the greater part of it, and then rest for about twenty-four hours before beginning again upon the leaves. The male larva, as in *P. scythe*, has considerably longer antennæ, and the fore legs are much less expanded than in the female.

The cage, even in winter, is thoroughly sprayed with tepid water once a day, and it is interesting to see the thirsty larvæ lower their mouths to the pendant drops. Others, avoiding the shower, shrink closer to the under sides of the leaves, and cleverly incline their bodies to let the water run off the more quickly.

The insect, when feeding, still keeps to the under side of the leaf, and merely twists its head round so as to bring its mandibles within reach of the edge of the leaf. Really diurnal, the larvæ at this stage are most inclined to feed soon after dawn, and again during the last hour of daylight. I have at present twenty-nine larvæ, and unless the short days of an English winter have delayed their growth, some of them should soon be reaching the imago state, for Mons. Morton found his first perfect insect (a male) four months after the hatching of the first egg.

Since the above was written, four of the male larvæ have entered into the imago state, the first on February 14th.

Scampston, York.

[A plate illustrating this article will appear in a future number.—ED.]

NOTES ON THE DIURNI OF CENTRAL AND SOUTHERN FRANCE, AND CORSICA.

BY W. G. SHELDON, F.E.S.

A GOOD many of those who collect the European Rhopalocera, and who travel a considerable distance for some or most of them, do not realize the number of much wanted species that occur freely in the magnificent series of forests surrounding Paris. It is true one sees a good many notes in Kane and in other authors of the occurrence there of certain species, but the opinion generally seems to hold that the records refer chiefly to the long distant past, and that the species recorded are no longer to be found in the haunts described.

This was my own opinion until quite recently, but a conversation I had with M. H. Brown, who has for years past worked the district, led me to change it. M. Brown has most kindly made out for me a list of the Diurni observed by him as constantly occurring within a radius of, say, fifty miles from Paris at the present time, and I find from this that ninety-nine

species frequent this area, including, amongst others, the following much wanted and local species:—*Apatura iris*, *A. ilia* and var. *clytie*, *Limenitis populi* and var. *tremulæ*, *Araschnia levana*, *Melitæa maturna*, *Argynnis adippe* var. *cleodoxa*, *Erebia medusa*, *Hipparchia briseis*, *H. arethusa*, *Satyrus statilius*, *Enodia dryas*, *Pararge achine*, *Cænonympha hero*, *Thecla pruni*, *Chrysophanus hippothoë*, *Lycæna alcon*, and *Heteropterus morpheus*.

With the object of making the acquaintance of some of these species, I accompanied M. Brown on the evening of July 7th, 1906, down to the forest of Villers Cotterets, some forty miles north-east of Paris, our chief objects being the *Apaturidæ*—*Limenitis populi*, and *Araschnia levana* var. *prorsa*.

The following morning broke fine and cloudless, and the day turned out to be an ideal one for butterflies; it was, however, the only quite suitable day I was favoured with whilst in the district.

The *Apaturidæ* were in great force, sitting on a road running through the forest, imbibing at the damp spots, or at horse-droppings. Of the two species, *Apatura ilia* was by far the most plentiful, about one-third of the examples being the type; the other two-thirds were var. *clytie*. It was most exhilarating to come across half a dozen of these grand fellows settled on the road, on a patch. They were not difficult to net, and I suppose I must have captured some sixty specimens; quite one-half, however, were released, not being perfect. Amongst my captures was a fine example of ab. *iliades*. *Apatura iris* was not abundant, and thus very difficult to capture; only two examples, both males, were taken. *Limenitis populi* I did not see; M. Brown said I was a fortnight too late for it. The larvæ of *Araschnia levana* were abundant on the nettles, feeding in companies, each containing several dozens. This larva feeds during the day in damp shady spots. The broods are not difficult to distinguish, for, although they do not defoliate a patch of nettles to the same extent as a nest of *Vanessa urticæ*, they are sufficient to account for the defoliation of one or two stems; they do not seem subject to parasites, nearly every larva producing a pupa. Odd early imagines of the summer form (var. *prorsa*) were flying about in the road; they have much the appearance on the wing of a *Thecla*, and are equally difficult to follow in flight, for, apart from their inconspicuous dark colour, they move very rapidly. When settled on the road, or on a leaf, they have a decided habit of fanning the wings, after the manner of *Issoria lathonia*.

Other species noted in the forest of Villers Cotterets included *Brenthis ino*, plentiful and of large size, but past their best; *Limenitis sibylla*, abundant; *Dryas paphia*, abundant; *Lycæna arion*, a few; *Melitæa maturna*, one much worn specimen.

Whilst staying in this part of France, I paid a visit, on July

10th, to the forest of Compiègne. The Diurni here were similar in species to those of Villers Cotterets, but, amongst others, I captured several examples of *Argynnis adippe* var. *cleodoxa*, and one of *Dryas paphia* var. *valezina*. *Thecla w-album* was abundant on the blossoms of the bramble.

I was much interested with a (to me) new bait for the Apaturidæ, which M. Brown introduced to my notice, and which, I understand, is commonly used in France; this is a very strong smelling cheese, known as "marolle." I purchased one of these cheeses, which are not large, and placed portions of it on the road running through the forest where the "emperors" are abundant. Unfortunately, the only day on which I could try it was not a favourable one, with but little sun, and thus the bait did not have a fair chance; but it certainly attracted more "emperors" than any of the patches of natural bait lying about, and I believe that, given a good day, it would have proved very successful; at any rate, though strong smelling, it is certainly not so objectionable in the knapsack as some of the baits used in England.

I left Villers Cotterets on July 12th, *en route* for Vizzavona, Corsica, where I arrived on the 14th.

The butterflies of Corsica—and of Vizzavona and Corté especially, where I stayed whilst in the island—have been so much written up that there is very little that is new to be said about them. Everyone goes at the same time of the year, takes the same species, and takes them in the same places.

At Vizzavona the usual species were abundant, with the exception of *Papilio hospiton*, and I had no difficulty in obtaining all I required of them during the ten days I spent there. Of *P. hospiton*, ten imagines were observed, of which I netted nine; only four of these were, however, worth retaining. I searched the mountains for many miles round for larvæ, and almost missed them, except for two examples, which I found on the first day. Thanks, however, to the kindness of a friend, who gave me a hint of the kind of locality I ought to search, I succeeded, during the last two days of my stay, in obtaining twenty-seven larvæ; they were found upon a very local species of fennel, which I could only discover in three small localities. Unfortunately this plant dries up very quickly, and as the larvæ resolutely refused to feed upon every other umbelliferous plant I could find—at least a dozen in number, and including the common fennel (*Fœniculum vulgare*)—I only succeeded in getting eighteen to pupate, and most of these are very small.

At Corté, in the beautiful gorges of the Restonica and the Tavignano, I found the local form of *Hipparchia semele* var. *aristeus* abundant, and captured many fine examples of the magnificent Corsican form of that finest of European Argynnis, *Dryas pandora*. In the Restonica Gorge I obtained half a dozen

good examples of the interesting form of *Pyrgus sao* var. *therapne*, which I did not see elsewhere.

I left Corsica, July 29th, for Beauvezer, which is situated at about 4000 ft. altitude, in the Verdom Valley, in the heart of the Basses Alpes. My especial object in visiting this locality was to obtain a series of the very local *Erebia scipio*, which is said to be abundant there. For some reason, however, I could not hit off the species, and had to go away without even a specimen. Other species observed here were—*Pieris daphidice*, common; *Rusticus argyrognomon*, abundant, with beautiful blue females; *Melitæa didyma*, with fine straw-coloured females; *Erebia stygne*, *E. tyndarus*, *E. goante*, and *E. neoridas*; *Satyrus actæa*, and some beautiful forms of *Anthrocera fausta*, and other brilliant “burnets.”

On my way home I stayed a few days at Digne, arriving there on August 6th, and leaving on the 10th. Mr. Tutt, who was also staying at Digne, and I had some days' collecting, chiefly in the cross ravine, the stream of which empties into the torrent “eau chaudes,” a quarter of a mile beyond the baths. We found this ravine a magnificent locality at this time of the year, almost every butterfly in the neighbourhood appearing to be congregated there, probably attracted by the stream of water, and the flowers that grew in its bed so luxuriantly.

Amongst the species noted were—*Erebia neoridas*, in swarms, but almost all males, until August 9th, on which day the females were equally abundant; *Hipparchia arethusa*, also in swarms; *Satyrus fidia*, not infrequent; *S. statilius*, common; *Hipparchia semele*, abundant; *Satyrus actæa*, abundant, with the females in fine order; *S. cordula*, passé; *Melitæa deione*, the second brood, common but small; *Leucophasia sinapis*, abundant; *L. duponchelii*, second brood, one example only; *Chrysophanus doris*, abundant and fine; *Polyommatus meleager*, males common, females two specimens only, both of which were of the type form; *P. bellargus*, males abundant, females not seen; and *Thecla betulæ*, not infrequent at flowers. I was much surprised to find dozens of *Satyrus hermione*, in finest condition, settled on the trunks of the apple trees in the “eau chaudes” valley. I had taken them equally abundant and fine, a month earlier in the season, two years previously.

A day spent in the mountains in the vicinity of the Dourbes resulted in half a dozen good specimens of *Erebia scipio*, but in little else. Full-fed larvæ of *Papilio alexanor* were abundant wherever the food-plant occurred in the vicinity of Digne.

ON SOME NEW CENTRAL AMERICAN VESPIDÆ.

BY P. CAMERON.

(Concluded from p. 64.)

Zethus (Didymogastra) punctinodus, sp. nov.

Black, densely covered with short white pubescence; the lower third of the clypeus, a line on the base of the thorax, two spots, wider than long, on the apex of the scutellum, two longish lines, straight on the inner, roundly narrowed on the outer side, a broad lanceolate line on the sides of the abdominal petiole, incised above near the apex, a mark on the top of the base of second segment, rounded on the outer sides, incised on both sides in the middle, a lanceolate line, the narrowed end at the base, on the sides of the narrowed base of the second segment at the apex, and a line on the apex of second segment, distinct above, indistinct below, pale yellow; the raised apices of the second and third segments fuscous; apical joints of the antennæ orange-yellow below. Wings tinged with fuscous, distinctly clouded at the apex. ♂. Length, 12 mm. to end of second segment.

Acapulco, Mexico.

Apex of antennæ thick, forming a roll, the two end joints curved, thick, clearly separated. Clypeus sparsely punctured, densely covered with depressed white pubescence; the front and vertex closely, distinctly punctured; the ocelli thus . . ., the hinder separated from each other by a greater distance than they are from the anterior, and by a slightly greater distance than they are from the eyes. Clypeus longer than usual, compared with the width; the apex with two short teeth. Apex of pronotum raised into a narrow horny keel, of a darker colour than the yellow line at its apex. Mesonotum closely punctured, without keels or furrows; the scutellum more strongly but not so closely punctured, the centre depressed at the apex. Post-scutellum narrowed to a broad rounded point. Metanotum broadly depressed in the middle, the sides rounded; it is transversely striated. Abdominal petiole not quite so long as the thorax, distinctly narrowed at the base, less so at the apex; it is shining, distinctly but not strongly or closely punctured. The narrowed base of the second segment is about one-fourth of its length; the segment shining, densely pruinose, the apex flat, smooth, the horny reflexed part wide; on the third segment it is narrower, and not so strongly reflexed. Tibiæ testaceous in front.

The peduncle of the second abdominal segment is shorter than it is in the other species described in this paper. Belongs to Saussure's Section A.

Zethus (Didymogastra) erythrogaster, sp. nov.

Black; the abdomen, except the narrowed basal part, red; the under side of the antennal scape, a small spot over each antenna, a slightly larger one in the inner edge of eye incision, a small spot near the top of outer orbits, a narrow line along the keel on base of pronotum, two spots on scutellum, narrowed and rounded on inner side, a small mark below and in front of tegulæ, a narrow line,

widened laterally on apex of first abdominal segment; a larger triangular mark on the sides in front of this, and a narrow line on the apex of the first abdominal segment, yellow. Legs black, the knees yellowish, the apical third of the femora, and the base of the tibiæ more broadly in front, rufous. Antennæ with a hook, the apical joints rufous. Wings fuscous violaceous, the tegulæ dark red. ♂. Length, 16 mm.

Mexico.

Abdominal petiole as long as the thorax, the narrowed base half the length of the dilated apex, which is longish ovate; the second segment with a narrowed neck half the length of the apex, which is cup-shaped, becoming gradually roundly widened towards the apex, followed by a reflexed pale horn-like part. Clypeus wider than long, strongly punctured, the apex depressed, smooth, broadly rounded. Front and vertex closely, rugosely punctured, the ocelli . . .; the hinder separated from each other by the same distance as they are from the eyes. Thorax closely punctured, the metanotum almost smooth, densely covered with grey pubescence; the metapleuræ bare, shining, smooth, except the lower part, with stout striæ. The third and fourth abdominal segments are closely punctured, the others smooth; the red on the apical is tinged with yellow.

Belongs to Saussure's Division *Didymogastra*, B. The antennal hook is narrow, curved, fully four times longer than it is thick. Mandibles widened at the base, without distinct teeth, the apex smooth, shining, bluntly rounded.

Zethus (Didymogastra) carinicollis, sp. nov.

Black; the clypeus, mandibles broadly in front to near the apex, under side of antennal scape, a small spot above each antenna, a narrow interrupted line on post-scutellum, a spot on the sides of apex of petiole, produced below backwards along the sides, a longish spot, narrowed at the base, on the base of the thickened part of second abdominal segment, and a narrow line, all round, on the apices of the second and third abdominal segments, lemon-yellow. The outer side of the four anterior femora at the apex, their tibiæ entirely, and a line on the basal half of the hind tibiæ behind, and two longish, moderately wide marks on the apical slope of metanotum—the marks widest below—bright lemon-yellow. Apical three joints of antennæ pale ochraceous yellow, including the "hook," which is only slightly curved, is broad at the base, and becomes gradually narrowed to a sharp point. Wings hyaline, the stigma and nervures black. ♂. Total length, 10 mm.

Mexico.

Abdominal petiole as long as the thorax, the basal fourth narrowed, the rest becoming gradually widened at the base, and not much narrowed at the apex. The second segment has a narrow, cylindrical petiole about two-thirds of the length of the rest of the segment, which is cup-shaped, rounded at the base, transverse at the apex; it is, as is also the first, smooth, shining, except for a narrow punctured band on the apex; the other segments are strongly punctured at the apex.

Clypeus broad, sparsely, weakly punctured; its apex broadly rounded, with a short, stout tooth on the sides of the middle third. There is a large, rounded apical tooth and a short, much less distinct apical one on the mandibles. Base of thorax transverse, raised into a thin, pale horny projection, which is continued along the basal half of the propleuræ, below the top; the apex bluntly rounded laterally, the centre rather flat, the middle with a narrow furrow; except in the centre it is closely, strongly, more or less obliquely striated. Front and vertex strongly, closely punctured; the ocelli in a triangle; the mesonotum is less closely punctured and the scutellum still less closely punctured; the post-scutellum smooth, punctured at the base. Pro- and mesopleuræ strongly punctured, the metapleuræ smooth, except for some fine obscure striæ above and along the apex.

This is a *Didymogastra*. The last joints of the antennæ can neither be called "a rolled spiral" nor a "hook," but the appendage approaches in form more the latter than the former.

Zethus nitidinodus, sp. nov.

Black; a broad curved band on the apex of the clypeus, its upper edge irregular, a small spot above each antenna, a small one on the outer orbits above, a line on the sides of post-scutellum, about three times longer than wide, a mark, wider than long, narrowed on the inner side, on the sides of pronotum, a conical mark, obliquely narrowed above, below the tegulæ, and two large, irregularly pyriform marks, dilated below and with the outer side oblique, straight, on the apex of metanotum, a line on the apex of first abdominal segment, narrowed in the middle and continued backwards on the sides below for about as far as the width of the segment, and a much narrower line on the apex of the second, pale cream-yellow. Abdomen very smooth and shining, the apical segments thickly covered with grey pubescence; the petiole not so long as the thorax, and not much longer than the second segment; its basal fourth narrowed, spinose laterally at the base; the thickened apical part distinctly narrowed at the base, slightly narrowed at the apex, which is depressed. Second segment bell-shaped, the base narrowed into a short neck, about twice longer than wide; it is about one-fourth longer than it is wide at the apex, which is neither reflexed nor channelled; but the third segment is distinctly reflexed. Wings fuscous violaceous, the nervures and stigma black. Antennæ with a longish, stout, little curved hook. ♂. Length, 22 mm.

Mexico.

Front strongly, closely punctured, the vertex more sparsely and weakly so, its hinder edge smooth. Clypeus sparsely, distinctly punctured, its apex bluntly, shortly bidentate, the sides curved. Ocelli in a curve, the hinder separated from each other by a distinctly less distance than they are from the eyes. Base of thorax above clearly separated, keeled behind, the sides distinct, but not projecting. Parapsidal furrows distinct, complete. Scutellums smooth, not furrowed, the apex broadly narrowed behind. Depression in centre of metanotum deep, the lobes broadly rounded. Apical two joints of antennæ dark cream-coloured, the hook black, its apex reaching to the base of

the tenth joint. Mesopleural furrow narrow, crenulated. Mandibles with strong scattered punctures at the base. There is a narrow keel on the basal half of the mesonotum.

This is a *Zethusculus*, and belongs to Saussure's Section B. (Syn. Am. Wasps, p. 29). It is one of the largest species, and is probably related to *Z. larinodus*, Smith, of which only the female is known. Smith does not describe the form of the basal two abdominal segments. The present species can hardly be its male; e. g., *larinodus* has the metathorax opaque and immaculate, not smooth and shining, and with two large white maculæ; in Smith's species, too, the abdomen is immaculate.

Zethus fortistriolatus, sp. nov.

Black; the under side of antennal scape, a narrow line round the top of pronotum and the apices of the abdominal segments narrowly, yellow, two marks on the apical slope of metanotum, narrow above, becoming gradually widened from the middle towards the apex, the inner side straight, the outer rounded, of a paler yellow colour; the outer side of the four front tibiæ testaceous. Wings hyaline, darker in front, very iridescent, the stigma dark testaceous, the nervures black. Pro-, meso-, and metanotum strongly, closely, slightly, obliquely striated. Abdominal petiole slightly longer than the thorax, gradually slightly narrowed from the middle to the base; the apex flattish above. The narrowed basal part of the second segment not much longer than wide, the rest bell-shaped, becoming gradually roundly widened towards the apex, which is distinctly narrower than the length of the segment. ♀. Total length, 16 mm.

Nicaragua.

Vertex strongly, irregularly striated, more or less strongly punctured, the front closely, regularly, somewhat strongly striated, the striæ extending to the hind ocelli. Clypeus wider than long, the middle of the apex (forming one-third of the whole) transverse, clearly separated; the punctuation is strong, the punctures longish, deep, intermixed with striæ; there is a strong, short, longitudinal keel in the centre of the top. Ocelli in a longish triangle, the hinder separated from each other by a little less distance than they are from the eyes. Temples wide, rounded, not much shorter than the top of the eyes. Occiput transverse, sharply margined. Thorax more than twice longer than wide, the base transverse, margined, its sides not projecting, the apex broadly, roundly narrowed, the metanotum formed of two rounded lobes. Pleuræ strongly punctured, the punctures long, clearly separated, those on the base of the propleuræ almost forming striæ. Abdominal petiole irregularly punctured in the middle above, the apex smooth, depressed towards the punctured part; the sides strongly, closely punctured, except at the base and apex; the rest of the abdomen is almost smooth and densely covered with fuscous pubescence. The scutellum is strongly, closely punctured, except on the sides, the middle depressed; the post-scutellum is obliquely depressed at the base and apex, the apical slope being longer and narrowed to a blunt rounded point. The pubescence on the head and thorax is longish,

fuscous, and not very dense. There is the appearance of a macula on the sides of the clypeus. There is a triangular tubercle above the antennæ; its sides are obliquely sloped; the middle shining; below it is continued as a keel down the face; on either side above is a yellow spot. There is a distinct, bordered furrow on the apex of the second segment. The striation on metanotum is oblique above, in the centre transverse, not so close and stronger.

This species has the appearance of an *Eumenes* with its long non-dilated abdominal petiole. It belongs to the group of *Z. strigosus*, Sauss.

CURRENT NOTES.

By G. W. KIRKALDY.

(Concluded from p. 39.)

90. PETERSEN, W.: "Die Morphologie der Generationsorgane der Schmetterlinge und ihre Bedeutung für die Artbildung." *Mém. Ac. Sci. Péterb.* (8) xvi., No. 8, 1-84, figs. 1-64 (1905). [Lepidoptera].
91. LINDEN, M. VON: "Über den Einfluss der Sauerstoffentziehung während des Puppenlebens auf die Gestaltung der Schmetterlinge." *C. R. 6 Congr. Int. Zool.* 491-6. [Lepidoptera].
92. *Id.*: "Physiologische Untersuchungen an Schmetterlingen." *Z. Wiss. Zool.* lxxxii. 411-44, plate 25 (1905). [Lepidoptera].
93. *Id.*: "Recherches morphologiques, physiologiques et chimiques sur la matière colorante des Vanesses." *Ann. Sci. Nat. Paris* (8) xx. 295-363, plates 11-12 (1905). [Lepidoptera].
94. KOTINSKY, J.: "Preliminary Notes on Lantana Insects in Hawaii." *Proc. Hawaiian Livestock Breeders' Ass.* pp. 69-78, figs. 3-8 (1906). [Diptera, Lepidoptera, Hemiptera].
95. *Id.*: "Hornfly and its Parasites in Hawaii." *Op. cit.*, 78-80, f. 9 (1906). [Diptera, Hymenoptera].
96. SMITH, J. B.: "Explanations of Terms used in Entomology." *Brooklyn Ent. Soc.* pp. i.-vii. and 1-154, plates i.-iv. (1906).
97. FOLSON, J. W.: "Entomology, with special reference to its Biological and Economic Aspects." (Philadelphia), pp. 1-485, plates i.-v. and numerous text-figs. (1906).
98. BUENO, J. R. DE LA TORRE: "Life Histories of North American Waterbugs." *Canad. Ent.* xxxviii. 189-97 (June 5th) and 242-52 (July 7th, 1906). [Hemiptera].
99. FELT, E. P.: "The Gypsy and Brown-tail Moths." *Bull. N. York State Mus.* (103), pp. 1-42, plates 1-10 (two of these being coloured) (July, 1906). [Lepidoptera].
100. *Id.*: "Twenty-first Report of the State Entomologist." *Op. cit.* (104), pp. 47-186, plates 1-10, text-figs. 1-48 (Aug. 1906).
101. SCHNEIDER, A.: "The Phenomena of Symbiosis." *Minnesota Bot. Studies, Bull.* 9, pp. 923-48 (May 31st, 1897).

102. TOWER, W. V.: "A New Method of preparing Wings and other parts of Insects for Study." Ent. News, xvii. 218-9 (June, 1906).
103. WHEELER, E. G.: "British Ticks." Journ. Agric. Sci. i. 400-29, plates v.-x. (March, 1906).
104. SORAUER, P., LINDAU, G., and REH, L.: "Handbuch der Pflanzenkrankheiten" (New Edition), iii. 70-80, figs. 5-28 (1906).
105. HART, J. H.: "The Cockroach as a possible friend to the Cacao Planter." Bull. Misc. Inform., Trinidad Bot. Dep., No. 48, pp. 239-40 (Oct., 1905).

In three volumes of over 1500 pages, with 834 text-figures, Distant has briefly discussed (58) a part of the Oriental Hemiptera, *viz.*, the Heteroptera, Cicadidæ, and Fulgoroidea of India, Ceylon, &c. The volumes will be useful on account of the, usually, excellent figures, each genus being figured. Further details, in many cases, would, however, have been of value.

Brown (59) notes that the weevil *Aræocerus fascicularis* feeds on Ignatius' bean (*Strychninos ignatii*) in the Philippine Islands. Strychnine is one of the deadliest human poisons known, yet the beetle actually breeds in the cavities it has bored in the seed.

Stretch's paper (60) consists of nearly 350 figures of American Arctiidæ, without other letterpress than the explanations.

The Blepharoceridæ are recorded from New Zealand for the first time by Chilton (61), who describes and figures some larvæ. The adults have not yet been reared.

Crombrugghe de Picquendaele has catalogued (63) the 1041 Microlepidoptera of Belgium, with synonymy, localities, food-plants, &c., while Kirkaldy has enumerated (68) the genera of fifteen families of Hemiptera, with their synonymy and type-species, and with references to figures.

Schrottky (67) describes and figures a Cicadid from South America with a remarkably malformed head.

The 'Bericht' (65-66) is the most complete (as a whole) of all entomological records, but is sadly dilatory. We now have a 'General Record' and 'Coleoptera' for 1904 (the 'Zoological Record' for 1904 having long ago appeared), and the Hymenoptera and Lepidoptera for 1901, the other orders not having advanced beyond 1900. The recorder for the Introduction and Coleoptera has, moreover, sacrificed completeness and accuracy to (comparative!) speed, his contributions being far the least satisfactory. In the 'Allgemeines,' 67 titles out of the first 148 (A-G), are marked as unseen, including papers in such well-known channels of publication as the 'Canadian Entomologist,' S. B. Ges. Nat. Freunde Berlin (the recorder is a German, the 'Bericht' is published in Berlin!), Trans. Linnean Soc. London, and the 'Entomologist'! C. S. Banks of Manila is (for the recorder) identical with N. Banks of Washington, D.C. Dealing with foreign tongues, it is inevitable, perhaps, that such mistakes

should occur as "secondary," "live-history," "alluvial," "injurious," "Hursley," "pratique" (for "pratiche"), "Girauld," "taid" (for "laid"), &c. Mr. Bouskell is cited for a paper on "Three weeks in the wilds of"! the locality being left to the imagination of the reader. Bibliography is always a thankless task, but the composition and reduction of one of the two principal records of entomology ought to be more complete and careful than that.

The 'Zoologischer Jahresbericht' gives (64) *inter alia*, a list of the principal papers on Entomological Anatomy, Bionomics, &c., published during 1905, with brief summaries of some of these. It is useful as being the earliest, but is very incomplete.

Nos. 69-74 have nothing directly to do with entomology, but the latest maps (70-1 and 74) are, surely, always welcome to entomologists, as well as topographical information on any out-of-the-way country (69, 72, and 74).

Morgan offers an alternative suggestion (75) to Boveri's theory, and considers that so-called gynandromorphism "may be due to two (or more) spermatozoa entering the same egg, one only fusing with the egg nucleus, and the other not uniting but developing without combining with any parts of the egg nucleus. . . . The products of division of the paired nucleus will account for the female part of the embryo, while the products of the division of the single sperm nucleus will account for the male characters of the other parts."

Heymons (76) notes that parthenogenesis occurs in some species of *Machilis*. Thienemann (77) deals with the biology of the pupæ of Trichoptera, while Brues (78) discusses certain points in the life-history of Stylopids.

Carpenter (79) notes that *Drosophila* is negatively geotropic, positively heliotropic; mechanical irritation of the fly has a kinetic effect, since it induces locomotion; the same is true of light. Holmes continues his observations on the reactions of *Ranatia* to light, dealing also with *Notonecta* (80). Mjöberg has a note on "mimicry" in the nymphs of *Coriscus* (*Alydus*) *calcaratus* (81), while Green (82) relates the killing of a Millipede by the nymph of *Ectrichodia* (*Physorhynchus*) *linnæi*.

A number of interesting papers on Orthoptera require notice. Kreidl and Regen deal with the stridulation of *Gryllus campestris*, having largely used the phonograph in their researches (83); Voss discusses (85) at great length the thorax in *G. domesticus*, with its appendages, and, after treating of the comparative anatomy and mechanism, compares the Orthoptera with other insect orders. Hancock deals with the stridulation, oviposition, and a meta-thoracic secretory organ (86) in *Ecanthus fasciatus*. Röhler discourses on antennal sense-organs in *Tryxalis* and *Musca* (84).

Marchal notes the parasitizing of *Galeruca* by a Hymenopteron (87), while Von Wagner (88) treats of the genesis and development of socialism in Hymenoptera.

A number of papers on Lepidoptera also invite attention. Von Linden has recently issued three papers, principally on experiments with the pupæ of Vanessids (91-93), while Peterson (89-90) deals with the morphology of copulatory organs in the same order and their value for species-determination.

Kotinsky (94) discusses pests of Lantana, describing and figuring an Ageomyzid Dipteron, a Lepidopteron, a Coccid, and a Tingid. The same author (95) deals with the Hornfly (*Hæmatobia serrata*) and its parasites.

Smith (96) has published an indispensable and long-wanted list of terms used in entomology, with their explanations. The plates are good and clear, except the one dealing with the nomenclature of colours, which is certainly unlike anything used by entomologists, and which omits many—indeed most—of those actually largely in use. A modern plate of this sort is still much wanted.

Folsom's Text-book (97) is somewhat like that of Carpenter, published in 1899, as regards its scope, but is still different from anything in the field. About one-third of the work is taken up with a review of anatomy and development, the remainder being biological and speculative.

Bueno (98) has worked out in considerable detail the life-histories of two American Waterbugs, viz., *Belostoma fluminea*, Say, and *Ranatra quadridentata*, Stal.

Felt (99) has published a brief report on *Porthetria dispar* and *Euproctis chrysorrhæa*, on account of the great danger of these moths being introduced into New York State.

The Twenty-first New York Report (100) is of the usual scope of these valuable bulletins. Among the contents may be mentioned, "Studies in Cecidomyiidae" (pp. 116-32, figs. 15-48), and notes on "Mosquito Control" (pp. 109-16, plates 3-10).

Schneider's general *résumé* of the phenomena of Symbiosis (101) has been overlooked in zoological records. He classifies them as follows:—

- I.—Incipient (Indifferent).
 1. Accidental.
 2. Contingent.
- II.—Antagonistic.
 1. Mutual antagonistic (mutual parasitism).
 2. Antagonistic (parasitism).
 - a. Obligative.
 - b. Facultative.
 3. Saprophitism.
 - a. Facultative.
 - b. Obligative.
- III.—Mutualistic Symbiosis.
 1. Nutricism (semi-mutualistic).
 2. Mutualism.
 3. Individualism.
 - a. Semi-.
 - b. Complete.
- IV.—Compound.

Tower (102) recommends the use of hydrogen peroxide instead of potash.

Wheeler (103) discusses the British Ticks. Sorauer's 'Hand-book of Plant Diseases,' now in a new edition, has reached the Arthropoda; the latest fascicule deals with noxious Crustacea and Myriapods.

Hart (105) states that the "Common Cockroach" is supposed to feed on minute red perithecia of the Cacao Canker Fungus in the interstices of the bark of Cacao trees. If this is found to be so, the Cockroach will be regarded, when in abundance, as a valued friend to the Cacao planter, as destroying the means of reproduction of the fungus.

NOTES AND OBSERVATIONS.

OXYPTILUS PILOSELLÆ IN HERTFORDSHIRE.—In the collection of Lepidoptera given to me by Mr. T. F. Furnival, and referred to on page 36, I have found five specimens of *Oxyptilus pilosella*, which were taken by him on the canal-bank near Tring Station on August 13th, 1905. This species has not previously been recorded for Hertfordshire, so that I have pleasure in adding the name to our county list. Dr. T. A. Chapman has kindly confirmed the identification of the specimens. Mr. T. H. Court, of Market Rasen, was with Mr. Furnival at the time the capture was made, and also took some specimens.—PHILIP J. BARRAUD; Bushey Heath, Herts, March 4th, 1907.

"CURRENT CRITICISM."—My attention has been drawn to the article "Current Criticism," by Mr. Kirkaldy, in the March number of your Journal. Mr. Kirkaldy censures Mr. Distant for want of "accuracy in dates," and gives citations from the volumes on the Rhynchota in the "Fauna of British India" Series. I wish to say that, so far as these examples are taken from vol. iii. of the work in question, I, as editor, and not Mr. Distant, should be blamed for the errors in dates. With regard to the date of the text of the 'Coquille,' I would point out that the title-page of the 'Voyage Coquille Zool.,' vol. ii., bears the date 1830, that this date was at first accepted by Messrs. Sherborn and Woodward (Ann. & Mag. Nat. Hist. ser. 7, vol. vii., 1901, pp. 391-392), and that the correction (*tom. cit.*, ser. 7, vol. xvii., 1906, pp. 335-336) was not published till after Mr. Distant's vol. iii. was in print. Further, the errors in dates quoted by Mr. Kirkaldy, however reprehensible in themselves, involved no question of priority.—C. T. BINGHAM; March 12th, 1907.

BARRETT'S 'LEPIDOPTERA OF THE BRITISH ISLANDS.'—A GOOD BOOK SPOILED BY ITS INDEX.—Some fifteen years ago we were all delighted at the announcement of a comprehensive work on the Lepidoptera of the British Islands from the pen of that veteran entomologist, Charles G. Barrett. The work has just come to an end, unfortunately after the decease of the author. Whatever may be our views as to the classification adopted, we shall value the book as affording a lasting record of the author's vast personal knowledge in the life of so many

of the species treated of, and have anxiously awaited the issue of the concluding part, on the assumption that it would contain a specific index that would enable easy reference to any particular species to which it might be desired to refer. But what do we find? A so-called "General Index to the entire work, including Families, Genera, Species, and Synonyms"; but as it gives no clue as to what genus a given species may be placed under, one may, as likely as not, have to hunt through many pages in order to find the reference to the species desired, and the value of the work as a book of reference is correspondingly depreciated. The blame for this serious omission cannot be laid upon the author. He had a perfect right to adopt any method of classification he pleased, and had he lived to see the completion of his work, would doubtless have taken the necessary means to enable his readers to easily follow him. Nor can Mr. South, who, we are told, has seen the concluding portions of the work through the press, be suspected of so serious an omission; his methods in such matters are too well known to admit of any such suggestion. Is it too late to hope that the publishers may yet see the error of their ways and be induced to provide a comprehensive specific index, and thus raise this record of the life-work of an able British entomologist to the deserved position of a standard book of reference? Even if it were issued as an extra part everyone of the original subscribers would, I venture to believe, gladly take it, and the influence that it would have upon the stock still remaining in the publisher's hands must be manifest.—ROBERT ADKIN; Lewisham, March, 1907.

ERRATUM.—Page 66, line 5, for "vol. xii." read "vol. vii."

CAPTURES AND FIELD REPORTS.

NYCTIBORA HOLOSERICEA.—A very perfect specimen of this fine cockroach was taken on Feb. 28th, 1907, on a fruit-stall in Mansfield Market-place, and was presented to me by the stall-keeper; it is now in my collection. I think most probably it was introduced with bananas. In the January number of the 'Entomologist' for 1900 a good illustration of the insect is given. Mr. Lucas remarks that it is covered with a yellowish pubescence, which gives it the appearance, in some lights, of being phosphorescent, and that is a very good description of it. I only commenced to collect the cockroaches in 1906, but have already obtained the under-mentioned species locally:—*P. germanica*, *B. orientalis*, *P. americana*, *P. australasiae*, and *N. holosericea*, and the green cockroach.—WILLIAM DAWS; 39, New Wood Street, Mansfield, Notts.

PRODENIA LITTORALIS.—A specimen of this moth was attracted by the light in my brother's house at Quorn, in Leicestershire, and was secured by him; but, I am sorry to say, it was damaged in the capture. As he was not collecting at the time, he kindly gave the specimen to me. I do not know the exact date of capture, but it was some time in September, 1906, possibly imported in some stage with tomatoes. Is this moth double-brooded? Usually the imago appears in March and April.—WILLIAM DAWS.

THE PAIRING OF *CERASTIS LIGULA*.—I never remember seeing any statement as to whether our two closely allied species of *Cerastis* (*C. ligula* and *C. vaccinii*) pair in the autumn or in spring. I was therefore much interested in discovering a pair of *C. ligula* in cop. on an ivy-leaf in my garden at 5.15 p.m. on November 25th, 1906. They had separated at 9 p.m. the same evening, and I kept the female with the hope of her laying eggs before she died. To-day I find her dead, but no trace of any eggs. I don't ever remember taking this species in the spring, and therefore still feel doubtful as to when she really does oviposit. Can any of your readers solve the question?—Rev. G. H. RAYNOR; Hazeleigh Rectory, Maldon, February 4th, 1907.

P.S.—Last night (March 27th) I took a female of this species at sawfly. It may therefore be inferred that after pairing the female survives the winter, and oviposits in March and April.—G. H. R.

AMPHIDASYS BETULARIA VAR. DOUBLEDAYARIA.—Seeing your notice on "Melanism in Yorkshire Lepidoptera," by G. T. Porritt, F.Z.S. (*ante*, p. 23), I thought it might interest you to know that on the Lincolnshire Wolds var. *doubledayaria* appears to be the dominant form of *Amphidasys betularia*, as in the South-West Riding of Yorkshire. At all events, I have obtained a considerable number of pupæ, mostly under ash-trees, and all so far have been var. *doubledayaria*.—SAIRGNAR B. STEELMAN; Binbrook, Market Rasen, Lincoln, March 11th, 1907.

NOTES ON HERTFORDSHIRE INSECTS, 1906.—Captures in my light-trap at Bushey Heath during 1906 included the following species; those marked with an asterisk being new to my "light" list (which now totals three hundred and seven species), and one, *Gelechia diffinis*, is also new to the Hertfordshire list:—*Drepana binaria*, *Dipterygia scabriuscula*, *Calymnia pyralina*, *Selenia lunaria*, **Tephrosia crepuscularia*, *Eupithecia pulchellata*, *E. exigua*, *Pelurga comitata*, **Scoparia dubitalis*, **Hedya dealbana*, **Plutella maculipennis* (*cruciferarum*), **Gelechia diffinis*; also dark forms of *Axyia putris*, and a male and female *Spilosoma lubricipeda* with unusually large black markings. *Phigalia pilosaria* was taken as early as January 26th.

Sugaring in the garden was more successful than during the previous few years, and among others I took:—*Hydræcia micacea*, *Dipterygia scabriuscula*, *Apamea unanimes*, *Caradrina morpheus*, *C. cubicularis*, *Agrotis suffusa*, *A. saucia* (two females), *Noctua augur*, *Xanthia cerago*, *X. ferruginea*, *Polia flavicincta*, *Miselia oxyacanthæ* and var. *capucina*, *Agriopis aprilina* (one female, a rather dark form), *Hadena protea*, *H. genistæ*, *Orthosia lota*. A few *Plusia moneta*, *P. chrysis*, *Hecatera serena*, *Pericallia syringaria*, *Hepialus humuli*, and many commoner species were taken at dusk in the garden, and *Gonoptera libatrix* occurred in the house in February and September. *Pieris rapæ* was first seen on April 11th, and on the same day three *Vanessa urticæ* were seen in the garden. One specimen of *Thecla w-album* was taken here on July 16th; and *Vanessa atalanta* was seen at sugar on October 14th.

Several visits were paid to Pré Wood, St. Albans, in the company of Mr. A. E. Gibbs, the first being on March 31st to sallows, when we took a single specimen of *Tæniocampa populeti*, and two *Pachnobia rubricosa*; while the commoner *Tæniocampidæ* swarmed, accompanied

by a few hybernators. I obtained ova from *T. gothica* and *T. cruda*, and now have pupæ of both species. On April 22nd we took *Tephrosia crepuscularia* on trunks, and again on May 13th, when *Pieris rapæ*, *Euchloë cardamines*, *Syrichthus malvæ*, and *Ancylys lundana* were also seen.

Two visits were paid to Aldbury Down, near Tring, the first occasion being June 17th. I found *Lycæna alsus* and *Nisoniades tages* fairly common, the latter going over. Other captures were *Lycæna astrarche* (two), *Hesperia sylvanus*, *Euclidia mi*, *Crambus hortuellus*, *C. pascuellus*, *Scoparia dubitalis*, *Cnephasia subjectana*, and *Elachista argentella*. On the second occasion (August 4th) I found *Lycæna corydon* and *Hesperia comma* out in their usual numbers. A few *Hesperia thaumas* were discovered in the same spot as in previous years. As far as I can discover, this species is extremely local here, being confined to only a few square yards.

Regarding the Hymenoptera, I noticed that *Anthophora pilipes* was rather more abundant than usual in the spring; the first male was seen on March 18th, and the first *Andrena fulva* on May 5th. *Psithyrus rupestris* was not uncommon on Aldbury Down on June 17th, and *Bombus sylvarum* and *Abia sericea* were taken on the same day.

Of the Diptera, the following have so far been named:—*Bombylius major*, *Syrphus bifasciatus*, *S. ribesii*, *Eristalis pertinax*, *E. horticola*—all at St. Albans; *Empis livida* and *Cyrtoneura stabulans* at Bushey Heath; and *Volucella bombylans*, Aldbury Down.—PHILIP J. BARRAUD; Bushey Heath, Herts, February 24th, 1907.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 14th, 1907.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Goulton exhibited a series of *Hybernia defoliaria*, bred from Ranmore Common larvæ, most of the imagines being dark and more or less uniform.—Mr. Newman, pupæ of *Asteroscopus nubeculosa* of a transparent green colour, just like pupæ when first changed; and also spun-together tufts of reeds containing pupæ of *Meliana flammea*.—Mr. Rayward, a young living larva of *Strymon w-album*, which he had cut out of an egg in mid-January; it was still alive, although normally perfectly quiescent. Mr. Tutt noted that the species hybernated as a larva within the egg-shell.—Dr. Chapman, a large, very brown *Callophrys rubi* from the Riviera, with antennæ brown beneath; and two examples of the same species set to show position of "tails" of the wings when resting.—Mr. Adkin, a series of *Eubolia cervinata* reared from Eastbourne larvæ, and stated that the larvæ could only be found at night.—Mr. Kaye, a long series of *Heliconius hydara* subsp. *columbina*, with a pair of *H. amaryllis* subsp. *rosina* from Columbia, to show the extraordinary colour resemblance of the two species.—Mr. Harrison, for Mr. Mansbridge, a long series of *Agrotis ashworthii*, bred from North Wales larvæ, and read notes on the breeding habits of the larvæ, and variation of the resultant imagines. About twenty-four per cent. were very dark imagines.—Miss Fountaine, (1) the very local

form of the summer brood of *Pieris napi* var. *flavescens* from Mödling, near Vienna; (2) *Pieris daplidice* var. *bellidice* from Aix-en-Provence, and ab. *raphani* from Algeria; (3) *P. chloridice* from Asia Minor; (4) *Anthocharis cardamines* and its allies, *A. gruneri* from Greece, *A. damone* from Syria, *A. euphenoides* from South France, *A. eupheno* from Algeria, *A. belemia* and *A. falloni* from the desert district in Algeria, *A. pechi* and *A. charltonia* from South Algeria, *A. tagis* var. *bellezina* from Aix-en-Provence, and var. *insularis* from Corsica. — Mr. Hy. J. Turner read a paper entitled "Our Authorities: an Introduction to Entomological Literature," illustrating his remarks by a number of volumes issued previously to 1800, exhibited by Messrs. Adkin, Edwards, Sich, and himself.

February 28th. — The President in the chair. — Mr. H. W. Barter and Mr. F. D. Coote, of Camberwell, were elected members. — Dr. Chapman exhibited (1) a pupa of *Hastula hyerana* showing the jaws; (2) a specimen of *Capina alia* with a triple tarsus to the right hind leg; (3) a short series of *Leioptilus carphodactylus*, a plume new to Britain, taken at Folkestone by Mr. Purdey; and (4) some fine varieties of *Peronea cristana*. — Mr. South, an extremely pallid specimen of *Satyrus semele* taken near Canterbury. — Mr. Lucas, specimens of *Hyberria leucophearia* from Oxshott. — Mr. Rayward, ova of a thorn moth laid in a row on a twig of blackthorn. — Mr. Newman, cocoons of *Dicranura bicuspis* on birch-bark overgrown with lichen from Tilgate Forest. — Mr. Turner, Coleoptera from Waroona, West Australia. — Mr. Adkin, long varied series of *Dianthæcia carpophaga* from the South Downs, and gave notes on them. — A large number of lantern-slides were exhibited by Messrs. Lucas, Main, West (Ashted), Dennis, and Tonge, illustrating life-histories, protective resemblance, egg-capsules of *Blatta* sp., marine algæ, ova of Lepidoptera, and rare plants. — Hy. J. TURNER (*Hon. Rep. Sec.*).

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The usual monthly meeting of this Society was held in the Royal Institution, Colquitt Street, Liverpool, on February 18th, Mr. W. Mansbridge, Vice-President, in the chair. — The chairman communicated a paper entitled "Micro-Lepidoptera captured in Lancashire and Cheshire during 1906," and illustrated his remarks by specimens of all the moths referred to. There were no rare species among them, but about thirty additions to recent records were mentioned. — In illustration of the Tortrices of North Lancashire, Mr. C. H. Forsyth, F.E.S., of Lancaster, sent a box of some ninety species, collected mainly in the neighbourhood of Lancaster, including *Sciaphila penziana* from Arnside, *Conchylis alternana*, *Aphalia orceana*, *Grapolitha penkleriana*, and *Dicrorampha saturnana* from Lancaster. This exhibit proved a very useful contribution to our records for the northern part of the county. — Mr. Robert Adkin, F.E.S., of London, sent for exhibition a pair of the tortricid moth *Tortrix pronubana*, one of the most recent additions to the British list, and which attracted much attention. — Other exhibits were a series of beautiful water-colour drawings illustrating protective colouration in butterflies and moths by Mr. Newall, of New Brighton; the careful colouring, &c., of the insects portrayed were much admired. — Mr. Richardson, several well-arranged cases of insects for educational purposes.

March 18th.—Mr. W. Mansbridge, F.E.S., Vice-President, in the chair.—The members heard with regret of the death of Mr. John Robson, of Hartlepool, an honorary member of the Society, and one who had taken considerable interest in its welfare.—Dr. W. Bell, J.P., gave a most interesting demonstration of his methods of larva-preserving, and exhibited numerous beautiful examples of the art; some species being mounted upon preserved plants, others upon artificial foliage, many of the larvæ being accompanied by their respective imagines set in their characteristic resting attitudes. Dr. Bell also exhibited a specimen of *Plusia aurijera*, one of three captured in Cornwall by Mr. Moore. The insects remained unrecognized until recently. There are only two other records of this rare insect in Britain, *viz.* one now in the British Museum collection, and another in a Liverpool collection formed by the late Mr. Robertson, of Limehouse, which is still in the possession of his family.—Other exhibits were:—Mr. B. H. Crabtree, fine varieties of *Arctia caia*: (1) with yellow hind wings; (2) a chocolate form with nearly unicolorous fore wings; (3) with all the dark markings of a dull ochreous buff colour; (4) a specimen with white fringes to the fore wings, and reduced dark markings. Mr. Sopp, the cockroach *Phoraspis leucogramma*, Perty, taken in the Liverpool Docks, this being a Brazilian species not previously recorded as having occurred in Europe. Mr. W. A. Tyerman, a long and variable series of *Taniocampa opima* bred from Wallasey ova; some very dark forms were included. Mr. W. Mansbridge, a short series of *Zygæna minos* from Argyllshire, together with the Welsh form for comparison.—A paper by Mr. Robert Newstead, F.E.S., on the genus *Glossina* (tsetse flies) and *Stomopys* was announced for the next meeting on April 15th.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—February 18th, 1907.—Annual Meeting.—Mr. G. T. Bethune-Baker, President, in the chair.—The usual formal business of Reports, Election of Officers, Council, &c., having been concluded, Mr. J. T. Fountain showed living *Pieris rapæ*, L., and *Larentia multistrigaria*, Haw., the former having been taken on the wing on Feb. 15th, the latter having been bred.—Mr. H. Willoughby Ellis, the following Coleoptera:—*Barynotus schönherri*, Zett., from Knowle, a species not previously taken in the Midlands. *Anchomenus puellus*, Dr., taken in winter in frozen reeds near Birmingham. *Olisthopus rotundatus*, Pk., a variety taken at Bewdley, with much narrower thorax than the type. The insect was altogether more slender, but the thorax was narrower in proportion; it made it look like a new species.—Mr. G. T. Bethune-Baker, a boxful of the brightest coloured moths, as brightly coloured and beautiful as any butterflies. They were all from New Guinea, and chiefly consisted of the genus *Milionia* (Geometers) and various Agaristidæ, and included various new species.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—February 5th, 1907.—Dr. T. A. Chapman exhibited bred specimens of *Hastula hyerana*. Fifteen examples emerging between November and January were decidedly darker than any of four hundred specimens emerging at the normal time, *viz.* between August and October. It was suggested that the low temperature rather than the prolonged pupal period was the

cause of the darker coloration. — Mr. E. A. Cockayne, between sixty and seventy species illustrative of his notes on collecting in North Sutherland; an aberration of *Acronycta leporina* entirely white save for a large central black spot on the fore wings; and a fine series of *Camptogramma bilineata* spotted and striated with black were specially noteworthy. — Mr. H. M. Edelsten, *Acalla lorquiniana* from Norfolk. Attention was drawn to its similarity in miniature to *Senta maritima*, and to the fact that it produced similar varieties. — Mr. V. E. Shaw, *Pachys betularia*, including var. *doubledayaria* and several intermediates between this variety and the type; four nights' sembling at Bexley yielded fourteen types, fifteen var. *doubledayaria*, and seven intermediate forms. — Mr. P. H. Tautz, *Cosmia pyralina* taken at light in July, and *C. affinis* bred from larvæ beaten from elm; both at Pinner. — Mr. E. A. Cockayne read a paper entitled "Notes from North Sutherland," in which was recorded the capture of many species apparently hitherto not reported so far north in Great Britain.

February 19th. — Mr. E. A. Cockayne exhibited *Leucania flavicolor* and vars. *rufa*, *lutea*, and *argillacea*, melanic *Nonagria geminipuncta* from Bournemouth, *N. sparganii* from South Ireland, and many other allied species. — Mr. H. M. Edelsten, long series of many of the "wainscots"; also a pupa, *in situ*, of *Meliana flammea*, ova of *Nonagria geminipuncta*, and puparium of *N. typhæ* and *N. cannæ*. — Mr. L. W. Newman, pupæ of *M. flammea* bred in captivity; the larvæ, instead of pupating in stems, had drawn reed blades into perfect cylindrical form. Also a pupa of *Petasia nubeculosa*, which, although a year old, retained the greenish transparent appearance characteristic of newly-formed pupæ. — Mr. V. E. Shaw, a series of *Toxocampa pastinum*, Walmer, July, 1906, and *Laphygma exigua* bred in December. — A discussion on the "wainscots" was ably initiated by Mr. H. M. Edelsten, who, in his opening remarks, gave interesting details of the life-history of many species. — S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

A Natural History of the British Butterflies, their World-wide Variation and Geographical Distribution: a Text-book for Students and Collectors. By J. W. TUTT, F.E.S. Vol. i., pp. 479, plates xx. London: Elliot Stock. Berlin: Friedländer & Sohn. 1905-1906.

ANOTHER work by the indefatigable Mr. Tutt. This time it is the first of what are to be several volumes devoted to the British butterflies, all treated in his exhaustive style. The volume just completed contains about eighty pages of introductory matter of a general character relating to the eggs and larvæ, and deals with many of their characteristics, including the knowledge recently acquired of the association of some of them with ants, and of the carnivorous habits of certain species.

The rest of the volume, comprising nearly four hundred pages, is occupied with a detailed account of nearly all that is known of ten species—the eight British "skippers," the "small copper," and the

"large copper,"—now extinct in our islands, prefaced in every case by a full account of the superfamily, family, and genus to which it belongs. We cannot give a better idea of the thoroughness with which the work is done than by taking as an example of it the common *Rumicia phlæas*. This belongs to the superfamily Ruralides, comprising the "coppers," "blues," and "hairstreaks," and a historical account of their grouping by different authors, extending over sixteen pages. It is succeeded by five pages devoted to the family Ruralidæ. This is followed by five pages of the subfamily Chrysophaninæ, and four of the genus *Rumicia*, occupying three or four pages more. To the species itself eighty pages are appropriated.

After the original Linnean description, and a modern one in English, there follows a detailed description of the geographical and climatal variations, and the connection of these with temperature. These are succeeded by descriptions of variations in colour or markings—in ground colour, in the fore wings and hind wings, in suffusion, and in the under side—with copious information as to the localities and dates of capture of these varied forms. After this comes a full history and description of their egg-laying—of the egg itself and its parasites; of the larva, its habits and variations, its pupation and food-plants, and its parasites; of the pupa, its variations, and its pupal dehiscence; the time of appearance of the imago in its widely distributed localities over a large part of the world, its habits and habitats.

The plan observed in the author's 'British Lepidoptera,' of supplying voluminous and detailed information on all the points above mentioned, is followed here. Thus, under the head "Time of Appearance," are given more than eight pages of records, and afterwards, under the title "Localities," four pages more in small type. It is fair to say that these are not mere catalogues of dates and places. Some will think that for so common and widely distributed a species they are unnecessarily voluminous, and, standing alone as they do, their value is perhaps not commensurate with the space they occupy. But, with the aid of local climatologies and records of seasonal temperatures, &c., they would, for purposes of reference, furnish abundant and in many respects very valuable materials for any who may desire to construct a comprehensive and exhaustive account of climatal, seasonal, and other local influences on the distribution, abundance, normal times of appearance, and habits of any of the species of which these particulars are given.

Having described in general outline the comprehensive plan on which the book is written, an example, still drawn from the chapters on *Rumicia phlæas*, may be given of its treatment of the subject under the head of "Habitats":—"It is difficult to say what are the chosen haunts of this lovely little insect; yet one may not write 'everywhere' against it, for there are many spots where a specimen may never be seen. Distributed as it is from the Atlantic to the Pacific, in both the Old and New Worlds, and from the warmest north temperate regions to far within the Arctic Circle, and from the low hot plains of Southern Europe and Asia up the mountains to an elevation of from 8000 ft. (in the Basses-Alpes) to 15,000 ft. (in North-east Kumoia), it yet selects chosen places in which to live; and, as in America it is said

to prefer dry, sandy, or gravelly barren spots, or the sides of paths in dry pastures or upland highways, frequently invading towns, and finding the hottest corners for its gambols, so in Europe it selects sand-hills and sand-dunes, sloping chalk-hills, and flowery wayside banks, meadows, wood-ridings, heaths and moorlands, mountain pasturages, and other innumerable different spots. In Britain it loves our open chalk-hills in the southern and eastern counties, the limestone slopes of the western and northern counties, the sandstone of the south-western—*e. g.* the downs at Halling (Ovenden), and at Freshwater (Hawes), the sand-hills at Deal (Tutt), and near Findhorn (Mutch), and is especially abundant on the dry Triassic sandstone area of the central and northern parts of Nottingham (Goss); the heaths at Newbury (Kimber), the moorlands of the Western Highlands (Tutt), rough stony ground edging the woods near Truro, and at Weston-super-Mare (Whittaker); whilst fine bright examples occur in the isles of Bute and the Great Cumbrae (Swinton).” And so for another couple of pages, taking us through various localities—the Channel Islands, Scandinavia, France, the Riviera, Germany, Switzerland, Northern and Central Italy, Bulgaria, Syria, India, China, the Japanese Islands, as well as Abyssinia, the Canary Islands, Madeira, and the Pamirs. All this is admirably described.

We are glad to see that another volume, to contain the “hair-streaks” and “blues,” is in preparation, and will be published in 1907–8. The book will be the indispensable work of reference upon the subject of the butterflies found in Britain.

F. M.

Catalogue of British Orthoptera, Neuroptera, and Trichoptera. By the late C. W. DALE, F.E.S. Revised and corrected. Colchester: W. H. Harwood & Son. 1907.

PROBABLY students and collectors of the British Orthoptera, Neuroptera, and Trichoptera, though few enough still, are not quite so small a company as formerly was the case. The insects they are concerned with are no doubt somewhat difficult to preserve and to prepare for the cabinet, and when there do not make so fine a show as does a collection of Lepidoptera. But these insects possess one merit which places them in importance above all others—their antiquity. No scientific entomologist can therefore afford to remain uninterested in these orders, and we can with confidence recommend to his notice a catalogue of the British members of the orders, which Mr. W. H. Harwood has just issued; for one of the greatest helps to anyone working at a group of any kind is a good reliable list of the members included within its limits. Originally drawn up by the late Mr. C. W. Dale, F.E.S., it has been revised and brought thoroughly up to date by various entomologists working at the orders. Criticism is scarcely needed, but we might say that as the Orthoptera are graded as to their status in our fauna, the introduced and naturalized species, and the occasional visitors might have been separated, their position on the list being so widely different. One other cockroach, *Blabera cubensis*, might have been added to the visitors, two having been accidentally introduced into Oxford last year. The genus *Auridium* should, of course, be *Acridium*.

W. J. L.

OBITUARY.

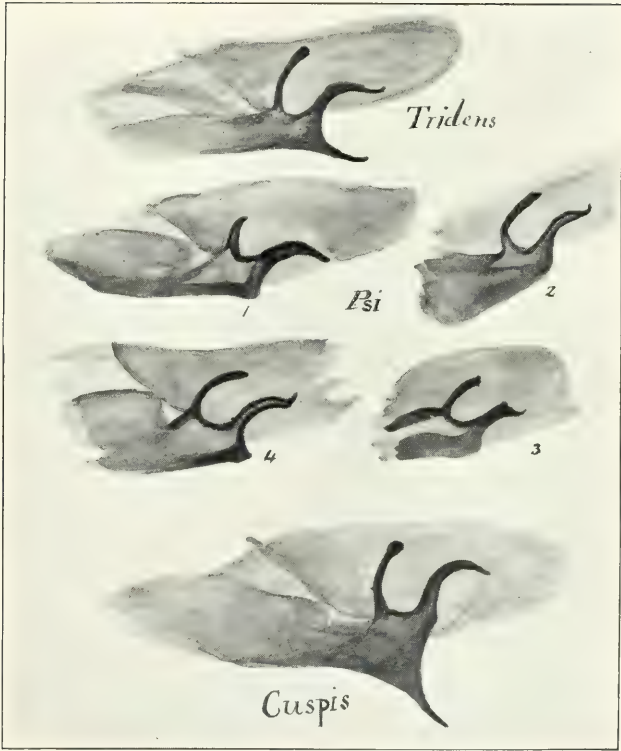
WITH much regret we have to announce the death of Mr. JOHN EMMERSON ROBSON, of Hartlepool, and also of Mr. WILLIAM JOHN CROSS, of Quayside, Ely.

We understand that Mr. Robson had been failing in health for some time past, but it was not until about two months ago that his illness assumed a serious form, and he passed away on February 28th, aged seventy-four years. He occupied a high position among the lepidopterists of this country, and was also interested in other branches of Natural History. With the object of cultivating and fostering a taste for Nature Study he founded and conducted the 'Young Naturalist,' which in 1879 was started as a penny weekly magazine, and was furnished with the sort of information that the beginner could appreciate. At the conclusion of the third volume, in October, 1882, the weekly issue was discontinued, and vol. iv. commenced in December, 1882, as a monthly magazine, and the plates which had hitherto been plain were coloured in this and the succeeding volume. At the end of 1890 the publication had reached the last number of vol. xi., and the concluding one of the 'Young Naturalist,' the number for January, 1891, being the first of the 'British Naturalist.' Under the latter title three volumes were conducted by Mr. Robson, and he then determined to discontinue publication with the part for December, 1893. In January, 1894, the magazine was carried on, as a new series, by Messrs. J. Smith and L. Greening, assisted by Mr. Robson, but we believe for that year only; our copy stops short at No. 10.

An exceedingly careful and well annotated "Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne," by Mr. Robson, was published in the 'Transactions' of the local Natural History Society for those counties. The first part, dealing with the Macro-Lepidoptera, was issued in 1899, and the second part in 1902. Part i. of the Micro-Lepidoptera, comprising the Pyralidina and Tortricina, was produced in 1905. He was elected a Fellow of the Entomological Society of London in 1890.

Mr. Robson was a member of the Town Council, and held, or had held, many other important offices in Hartlepool, in the affairs of which town he took a deep interest, and especially in educational matters.

Mr. W. J. Cross passed away on March 20th, aged 73 years. For the last four years his health had been undermined in consequence of a series of operations, and it was from the effects of the last of these that he succumbed. He was a keen entomologist, and the very fine collection of Lepidoptera that he formed represents over forty years of enthusiastic collecting. All who were privileged to associate with Mr. Cross found him a man of kind and gentle disposition, and one who was always anxious to assist his fellow-entomologists. Many young beginners have to thank him for his kindly help, which was ever extended to them most willingly. As a collector, he was well known in the New Forest, where he spent many months during nearly every summer. His death will be deplored by a very large circle of friends.



Spines on Clasps of Ancillary Appendages of *T. (A.) tridens*, *psi* (4 vars.), and *cuspis*, $\times 16$, from Camera Outlines (see p. 119).

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NEW AMERICAN BEES.—IV.

By T. D. A. COCKERELL.

Bombus rufocinctus astragali, n. var.

♀. Similar to *B. rufocinctus iridis* (Ckll. & Porter), but the broad black band of the abdomen is without any red. This looks exactly like *B. edwardsii*, Cresson, and has until now always passed as that species. On comparing it with Pacific coast *edwardsii*, I noticed a difference in the length of the malar space, and wrote to Mr. Viereck to examine the material labelled *edwardsii* in the Cresson collection. This he kindly did, reporting as follows:—

(1.) Malar space about half as long as wide. Two females, Colorado; one female, Washington State; one female, Montana.

(2.) Malar space a little more than half as long as wide, rather quadrate. Female, California; female, Nevada.

The latter is the real *edwardsii*. I had labelled the Colorado insect as a new variety of *edwardsii*; but Mr. H. J. Franklin, to whom I sent a specimen, is confident that it is an extreme variety of *B. rufocinctus*, the structural similarity outweighing the remarkable colorational differences.

Hab. Boulder, Colorado, June 9th, 1905, at flowers (white) of *Astragalus* sp. (W. P. Cockerell). Also Ward, Colorado, at *Phacelia* (Cockerell), and Florissant, Colorado (Rohwer).

Nomada ceanothi, sp. nov.

♀. Length about 7 mm.; belongs to *Nomada* as restricted by Robertson, and is very close to *N. florilega*, Lovell & Ckll. (from Maine), from which it differs as follows:—Red of clypeus extending upwards in middle line, almost to antennæ; third antennal joint conspicuously shorter, its length little exceeding its apical breadth; flagellum more slender; hind femora less infuscated; second abdominal segment with a pair of extremely large lemon-yellow spots, more or less pyriform in shape; third with large yellow spots; fourth without spots; fifth with a pair of very dull spots. Characters distinguishing it from other allied species (such as *N. illinoensis* and *N. sayi*) are as follows: *no trace of yellow at lower corners of face*; antennæ long, fourth joint a little

shorter than twelfth; mesothorax exceedingly coarsely punctured, dull red, with one broad black band; scutellum bilobed, but rather small; pleura largely red; *metathorax entirely black*; ventral surface of abdomen red without yellow markings; first dorsal segment black right across at base; b. n. going a considerable distance basad of t. m.; mandibles simple.

Hab. Glencarlyn, Virginia, at flowers of *Ceanothus*, June 21st (Nathan Banks). On the same day and flowers, at the same place, Mr. Banks took *N. perplexa*, Cresson.

Nomada banksi, sp. nov.

♀. Length, 8 mm. or a little over; black, the markings of the head and thorax entirely dark ferruginous; abdomen with bright lemon-yellow markings; legs red, partly suffused with black. Face broad; clypeus, a small supraclypeal mark, labrum, mandibles (except apex), and *lateral marks extending over summit of eyes*, with narrow posterior orbits, *all ferruginous*; mandibles simple; antennæ dark reddish beneath, blackened above, third joint about as long as fourth, flagellum stout; mesothorax very coarsely and densely punctured, entirely black; scutellum moderately bigibbous, with a red spot on each prominence; metathorax all black; pleura with a large red patch below, and a red spot above; tubercles and tegulæ red; wings dusky reddish; stigma ferruginous, nervures fuscous, b. n. just basad of t. m.; legs red, the middle and hind femora mainly black behind and beneath, hind tibiæ blackish behind; anterior coxæ with a small tubercle, but no spine; abdomen very finely punctured, black; first segment with a narrow yellow band broken into four parts; second with a very broad yellow band, much broadest laterally, and rather widely interrupted in the middle; third with a large transverse mark, notched below, on each side; fourth, the band entire but narrowed in the middle, and deeply notched behind at the sides; fifth with a large quadrate patch, emarginate in front; venter red, the hind margins of the segments broadly dark, one or two slightly indicated yellow dots. There is some resemblance in the colour and markings to *N. gracilis*, Cresson, known only in the male,* but I do not think it can be regarded as the female of that species. In Robertson's table it runs to *N. placida*, but is larger, and differs conspicuously in the abdominal markings. It is smaller than *N. electa*, and that species (*vide* Viereck) has the b. n. going far basad of t. m.; it also has some yellow on the legs. *N. electella* differs in the face-markings, tegulæ, &c.

Hab. Glencarlyn, Virginia, October 10th (Nathan Banks).

Nomada infantula, sp. nov.

♀. Length about 5 mm.; red, with a broad black band on the mesothorax and metathorax; mandibles simple; a blackish spot be-

* I examined the type of *gracilis* in the Cresson collection. It is about 8 mm. long; legs red and black; thorax black without marks; anterior edge of clypeus, lower corners of face and spot on base of mandibles yellow; apical plate of abdomen notched; second segment with a very large yellow mark on each side, third with a narrow interrupted band, fourth with a pair of spots, fifth and sixth each with a spot.

tween antennæ, and a black transverse patch enclosing ocelli; antennæ entirely red, fourth joint longer than third, but shorter than twelfth; mesothorax rugoso-punctate; scutellum moderately elevated and bilobed; pleura with a black patch beneath; legs red, hind tarsi blackened on outer side; tegulæ red; wings hyaline, the apex fuscous; stigma sepia-colour; b. n. some distance basad of t. m.; second s. m. broad, third narrowed almost to a point above; abdomen apparently without yellow spots, but close inspection shows a large very faint spot on each side of second segment, and small ones on third—these may be distinctly yellow and conspicuous in some specimens, perhaps; first segment with some blackish at sides of base; third infuscated apically; pygidial plate broad, pubescent; venter red, with only a dark mark on first segment.

♂. Length about 5 mm.; head and thorax black; a broad ferruginous band across lower part of face, including nearly all of clypeus, and sending a linear extension up the orbital margin, not quite as far as the antennæ; basal two-fifths of antennæ blackened behind; fourth joint conspicuously longer than third, and about or almost as long as last; joints four to seven with the apex somewhat projecting beneath, giving an imbricated appearance; tubercles ferruginous; pleura with much white hair; scutellum entirely black; hind femora and tibiæ suffused with fuscous; basal two-thirds of first abdominal segment black or almost; apical plate notched.

By the small size this resembles *N. parva*, Rob., but it is distinguished in the female by the very feeble spotting of the abdomen, and more especially in the male by the structure of the antennæ, and the absence of yellow markings on the abdomen.

Hab. Great Falls, Virginia, May 22nd (Nathan Banks). The two specimens, one of each sex, are gummed on the same card.

Anthidium blanditum prædentatum, subsp. n.

♀. Similar to *A. blanditum*, Cresson, but differing as follows: upper part of clypeus with a large W-like black mark, consisting of a pair of cuneiform marks side by side, the points directed downwards; anterior edge of clypeus also black, and a small dark area in the middle just above the edge; interruption of band on top of head broad, greater than the interval between the lateral ocelli; axillæ as well as scutellum with yellow bands; no yellow spot beneath tubercles; the first four abdominal bands interrupted in middle, fifth only notched; laterally, the first band is notched behind, the second in front.

Known from *A. montivagum* and *A. portera* by the bright lemon-yellow sixth abdominal segment, its margin evidently notched in the middle, and the elongated marks over the eyes.

Hab. Boulder, Colorado, June 22nd, 1906 (G. Hite).

Dianthidium pudicum (Cresson).

♀. Length about 8 mm.; strongly punctured; black with cream-coloured markings, no red colour anywhere on body or legs; ventral scopa pale orange; hair on inner side of tarsi pale orange; wings strongly dusky, especially the marginal cell.

Similar to *D. parvum*, Cresson, but the markings are paler; the clypeus has only a pair of small light spots, separated from the lateral face-marks by a narrow line of black; the tibiæ are black with only a light mark or spot at the base; the apical abdominal segment is entirely black, and the lateral part of the light marks on the fifth is wanting. The posterior notches of the light areas of segments two to four are large and strong.

Boulder, Colorado, September 19th, 1906 (S. A. Rohwer).

D. pudicum was based on two male specimens from Nevada, closely allied to *parvum*, but with cream-coloured markings. The female has not been described, but in the Cresson collection there are placed with *pudicum* two females from Colorado, with the abdominal bands yellow, and the clypeus with central part black. These, I think, do not belong there, and it is much more likely that the insect described above is the real female of *pudicum*. Whether it is more than a mutation of *D. parvum* is another matter.

University of Colorado, Boulder, Colorado:
March 26th, 1907.

A FEW NOTES ON SOME OF THE CORSICAN BUTTERFLIES.

BY MARGARET E. FOUNTAINE, F.E.S.

ALTHOUGH Corsica in recent years has become anything but a *terra incognita* to British entomologists, most Continental collectors having visited at some time or other the dry hillsides round Ajaccio, and the glorious forest of Vizzavona, I still hope, nevertheless, the following notes may obtain some little interest, for one reason that, during my stay there last summer, I visited more than one locality hitherto unexplored, at least by British entomologists; and also that my collecting in the island began several weeks earlier in the season than the time usually and indeed *well* chosen as being the most likely to be productive of good collecting; and of those who have waited till the end of June or even July before going to Corsica I can only say that they have acted wisely, as in May and early June, after a good series of *Anthocaris tagis* var. *insularis* is secured, there is but little to be done of much importance.

Luri (100 ft.), in Cap Corse, is, I think, the best place for spring collecting; and though the Hôtel de France is an inn of exceeding modesty, accommodation *can* be found there, but I can scarcely describe it as palatial, inasmuch as it boasts of but two tiny bedrooms, so that when these are both occupied, should a third guest arrive, the arrangement is that he sleeps on a sofa in the *salle-à-manger*. Evisa (2700 ft.), situated about 60 kils.

west of Corté, and about 70 kils. north of Ajaccio, is one of the most beautiful places I have ever seen, close to the borders of the great Forest of Aitone on one side, and on the other looking over chains of rugged mountains towards the sea and the sunset. Hôtel Gigli, too, being an inn of fair pretensions, clean and comfortable, with a most obliging proprietor, goes far to make a prolonged stay at Evisa exceedingly pleasant and agreeable. Then, too, a place little known to entomologists, but by no means unworthy of notice, is La Piana, built on a raised plateau, near the edge of a cliff, about 1400 ft. above sea-level, and close to the Calanche, a rocky formation of hard red sandstone, whose many weird forms and outlines would suggest having been wrought by the perpetual action of the sea in centuries gone by. These Calanche attract many French tourists to La Piana, in spite of the long diligence drive of some 60 kils. from Ajaccio.

I append a list of the most important amongst my captures, beginning with:—

Papilio hospiton, Gn.—My first capture of this rare and beautiful *Papilio* was on May 8th at Luri; four specimens were taken that day, but three of them were in bad condition, suggesting that their emergence from the chrysalis must have taken place some time in April. Yet I do not think that *hospiton* is double-brooded; specimens seem to emerge throughout May, June, and July, singly, and, according to my experience, by no means at frequent intervals. I only took it in one locality near Luri, on the top of the mountain pass, above Cagnano, and it was far from common. At Evisa it also occurred, but was decidedly rare. This butterfly seems to be unusually addicted to knocking itself about, so that by far the greater number of those taken were more or less damaged. The larva, when half-grown, is easily distinguishable from *machaon*, which, however, in its early stages it closely resembles; the black rings are more rugged in their outlines, and the general tone of the caterpillar more of an apple-green.

Anthocaris tagis var. *insularis*, Stgr.—The best place for this insect is undoubtedly Luri; I found three or four localities for it in that neighbourhood, in some of which the males were quite common. My first capture of it was on May 5th, on the pass below Seneca's Tower (950 ft.). It occurred also on the top of the pass above Cagnano (775 ft.), and on the southern slopes of the mountains near Luri, in which latter locality, with the able assistance of Bersa, I once took fourteen specimens in one morning. All these elevations were, at their highest points, just below 1000 ft. *Insularis* is a rapid flier, but, like var. *bellezina*, loves to settle on the pale mauve flowers of the wild rosemary, which much facilitates the chances of its capture. At Evisa in June it was rare, but still to be had in good condition. It was

practically over on a mountain south of La Piana at the end of that month. My efforts to obtain ova, or to discover the larva, of this butterfly were unfortunately unsuccessful.

Lycaena ægon, S. V., and var. *corsica*. The type, with, however, blue females, occurred commonly at Evisa and La Piana in June. Var. *corsica* was only taken by me on the very top of Col de Vergio (about 5000 ft.) in July, where it was extremely plentiful.

Charaxes jasius, L.—Along the steep rocky ridges, on the tops of the arbutus-clothed mountains round La Piana, all through the scorching heat of the midsummer days, *C. jasius* romps and gambols with his fellows; and, indeed, much to their own personal destruction do these summer idlers fight and frolic in the sunshine, so that it was not until I had caught several, and released as many, that I managed to secure three or four magnificent specimens in absolutely perfect condition. They showed no fear, these brave glorious butterflies of the south; they were angry, not frightened, when they found themselves prisoners in the net, and if disqualified, and therefore released, returned with just the same intrepid persistence to the very spot where they had so recently escaped from such a pitiful tragedy.

Vanessa urticae var. *ichnusa*, Bon.—My first capture of this butterfly was on May 16th at Luri. In June at Evisa it was common, and there were any amount of larvæ in all stages feeding on every kind of stinging-nettle. But I soon found to bring them home when full-fed was (at least in my first attempt) merely to breed one hundred per cent. of ichneumons; whereas afterwards a batch of tiny ones produced just as many butterflies. I also induced some females to lay, which they did very readily, shortly after being placed in the sun with plenty of nettles to choose from. On one occasion a female, having deposited quite a large batch of eggs, began to get very lively, so I removed her from that cage, where another female was busily laying at the same time; and the next day, having been well surfeited with sugar and water in the meantime, I put her back into the laying-cage again. She seemed very restless, and, though apparently wishing to lay, wandered anxiously about for some time in search of a suitable spot, till at last she found what she was evidently looking for, *i. e.* the same batch of eggs she had herself laid the day before, where she at once began laying again, more or less on the top of the others. I thought this all the more curious as the eggs laid by the other female were entirely ignored by her, though she once had a look at them, but nothing would please her but to find her own. She was subsequently released.

Argynnis eliza, Godt.—Appeared in great profusion in the Forest of Aitone, near Evisa, towards the end of June, and throughout July on the Col de Vergio.

A. paphia, L., var. *valezina*, Esp., and var. *anargyra*, Stgr.—All three occurred together in the Forest of Aitone in July.

A. pandora, S. V.—Very common at Evisa in July. The specimens were all dark, especially the females.

Satyrus semele var. *aristæus*, Bon.—First taken at La Piana on June 23rd. It was very common at Calacuccia towards the end of July.

S. neomiris, Godt.—First taken at La Piana on June 24th, where it soon became fairly common on the “*jasius*-haunted” ridges of all the mountains. Also very abundant at Evisa (outside the forest), on the Col de Vergio, and at Calacuccia in Italy.

Pararge megæra var. *tigellius*, Bon.—Met with throughout the summer everywhere. Apparently the only butterfly to be had during my first few days at Luri in May. I took a very fine female near Bastia on May 24th, in which the black apical spot on the fore wings was fully twice the normal size.

Cænonympha corinna, Hüb.—Was rather rare at Luri in May. Very common at Evisa and La Piana in June and July.

Syrichthus sao var. *therapne*, Rbr.—Taken first at Luri on May 9th, where, however, it was very rare. Also at Corté end of May. I do not recollect seeing it at all either at Evisa or La Piana. A brood emerged on July 25th at Calacuccia, so that I was just able to secure a few specimens before I left.

Milano: March 15th, 1907.

A RECORD EVENING AT THE ELECTRIC LIGHTS IN DURBAN, NATAL.

BY GEO. F. LEIGH, F.E.S.

I HAVE collected moths, &c., at the lights in Durban on and off for the past seven years; also in England, a good many years ago, in Shepherd's Bush Road, and, although I have frequently seen a great number, still the record for March 15th, 1907, is far and away above anything I have yet experienced.

The evening was very still and close, and there was a little lightning. I arrived at the Umbilo Road, about a mile and a half from the centre of the town, at about 7.45 p.m., and worked three arc lights. There were of different orders of insects simply thousands flying around each lamp. The ground below was covered, and also a wall near one of the lights. I give below a list of the moths taken, as far as I can, several being quite new to me, and, as I do not know the family they belong to, I must omit these.

Saturnidæ very few, only two examples of *Bunceæ tyrrhencæ*, one worn *Capaxa flavinata*, one *Ludia delagorguei*, and two *Urota sinope* turning up.

Sphingidæ were exceedingly plentiful almost throughout the evening, and I took the following :—*Chærocampa eson* (2), *C. capensis* (3), *C. celerio* (4), *Phlegethonotius fulvinotata* (2), *Polytychus grayi* (1), *P. postica* (3), *B. meda* (5), *Euchloron megæra* (1), *Nephele accentifera* (1), *Andriasa mutata* (one male), and *Temnora marginata* (2); *Sphinx convolvuli* gathered in great numbers, and many were run over on the ground by carts, rickshas, &c.

Of the Geometridæ very few occurred that I am able to identify, these moths not being named yet. I took, however, a banded variety of *Boarmia accaciaria*, and saw two or three others; also three specimens of *B. proximaria*.

The Noctuidæ simply swarmed, and a few rare ones were obtained. I captured one specimen of the scarce *Spiramiopsis coronna*, and am sending this to the Entomological Society of London, as I had previously sent them a blown specimen of the extraordinary larvæ of the species. *Plusia angulum* (many), *P. signata* (2), *P. oxygramma* (3), *P. chrysis*, *P. chalcites* (2), *Leucania loreyi* (1), *L. infima* (3), *Serodes inaria* (7), *Amyna selenampha* (1), *Ophiusa indeterminata* (2), *O. limbata* (1), *O. algira* (1), *O. echo* (2), *Agrotis segetum* (1), *A. muscosa* (1, and two vars. of same), *Chalciope stolidia* (5), *C. hyppasia* (4), *Thermesia atriplaga* (2), *T. irrorata* (1), *Bereia incedens* (1), *Entomogramma pardus* (3), and *Cytogramma latona* (2). Other species taken were *Diacrisia leinardi* (2), *D. lutescens* (4), *D. flava* (1), *Rigema ornata* (1), *Metarctia lateritia* (2), *M. rufescens* (four of the black variety, type-form very common), *Anthena simplex* (1), *A. tricolor* (3), *Duomitus capensis* (2), *Euproctis fasciata* (1), *E. pallida* (2), *Rhodogastria lupia* (one, rare), *R. astreas* swarmed (took two or three of the dark variety), *Mauvilia arcuata* (2).

The following butterflies also turned up, which, with the exception of the first-named, is very unusual indeed: *Melanitis leda* (2), *Myrina dermaptera* (a very fine female), *Papilio demoleus* (1), *Crenis boisduvali* (1), *Charaxes verannes* (one, damaged).

As I am now working hard at the Micros out here, I took in all about thirty different species; they were about in thousands, and I am glad at last to be able to get these properly attended to and named.

In conclusion, I may also state that there were hundreds of grasshoppers, locusts, &c., dashing about, and several beetles. I took six different species of water-beetles and some of the very large water-bugs, also on the wing. Altogether it certainly was a sight I should have been sorry to have missed. The bats, too, that are generally on the wing all the evening, disappeared soon after 8 p.m. I conclude they had had a good meal by that time. Strange to say, on the previous evening, with about the same weather, there was scarcely an insect to be seen.

Durban: March 16th, 1907.

NOTES ON LEPIDOPTERA AND COLEOPTERA CAPTURED IN 1906.

By H. F. & J. C. F. FRYER.

IN Cambridgeshire and Huntingdonshire the year 1906 was a successful one from a collector's point of view, but very little of genuine scientific value can be recorded.

In the Rhopalocera three species of *Thecla* were bred, viz., *T. pruni*, *betulæ*, and *quercus*, the two latter being abundant and easily reared. *Augiades* (P.) *comma* was taken on the Devil's Dyke the third week in August, and also one specimen of *Cupido minima*, which, we presume, would be the second brood.

In the Heterocera *Hylophila quercana* was recorded for the first time from our part of the Isle of Ely. *Leucoma salicis* seems on the increase, after being scarce for many years.

Noctuæ were not so plentiful as in 1905, but the quality was quite as good. *Cymatophora ocularis* turned up in some numbers at sugar, especially on white poplar, though occurring singly in most other situations as well. *Acronycta strigosa* again occurred, but only once, at sugar. A fine variety of *A. ligustri* was taken, resembling var. *coronula*, but without any light markings. Reed-feeding species were scarce, especially *Leucania straminea* and *Senta ulvæ*, though *Calamia lutosa* in October was not uncommon. *Xylophasia sublustris* in June was a new record for the district.

In Mid Devon one *Laphygma exigua* was taken at light, but on account of illness little collecting was done in this county.

An attempt was made to observe the relative numbers of *Miana strigilis* and its variety *æthiops*. The insects on a single round of about one dozen sugared posts were counted. The result was inconclusive, the numbers varying to too great an extent from night to night. On the whole, *æthiops* was in excess, about seventy per cent. being this variety.

Three specimens of the var. *bilinea* of *Grammesia trilinea* were taken. *Agrotis ravidæ* was again uncommon, only three specimens being noticed. *Tæniocampa opima* and *T. populeti* occurred at willows, but only singly. One perfect *Dicycla oo* was captured at sugar in July, in the fen, at least six miles from the nearest oak wood, where we have never yet found the species. One specimen of *Asteroscopus sphinx* was bred from larva beaten in May. *Bankia argentula* was common at Chippenham in June. This closes the list of Noctuæ, though all the regular species noticed in former years occurred as well.

In the Geometræ *Amphidasys betularia* var. *doubledayaria* was bred, being the first specimen observed in the district, although this species has been bred occasionally for a period of forty years.

One of the catches of the season was a specimen of *Sterrhæ sacraria*, taken while out shooting in Cambs. It is a male in

fine condition, and was taken flying in the sunshine in a marshy meadow.

Among the Pyralides *Perinephele lancealis* was the only fresh record. In the "Knothorns" *Euzophera pinguis* and *Cryptoblabes bistriga* were new to the district.

Tortrices were very disappointing, one specimen of *Stigmonota trauniana*, bred from maple bark, being the only notable occurrence.

No mention is made above of *Macrogaster arundinis*, *Lithosia muscerda*, *Tapinostola elymi*, *Nonagria brevilinea*, and *Hydrilla palustris*, taken in expeditions to Wicken and the Norfolk Broads, as these will probably be referred to in another note.

COLEOPTERA IN THE CHATTERIS DISTRICT IN 1906.

During the three years 1879–81, the first-named writer collected beetles somewhat assiduously, and then left them, mainly owing to the difficulty of identification—for Fowler's 'British Coleoptera' was not then within reach.

After twenty-five years' more or less desultory work among Lepidoptera—the last ten with the assistance of my son, J. C. F. Fryer—we came to the conclusion that not very much remained to be done in the immediate district as regards the mere addition of species. In January, 1906, I looked up my old collection of Coleoptera, and found with disgust how much one can forget in twenty-five years.

During the last year we have taken some three hundred species within the limits of the "district," and we give below a few notes of the more interesting species. Although the characteristics of this district have been referred to several times in our notes on Lepidoptera, it may be as well in this first note on the Coleoptera to repeat that it is comprised roughly within a radius of twelve miles of the town of Chatteris, and consists of both "highland," *i. e.*, land with a subsoil of the older geological formations, and cultivated fenland, of which the subsoil is partly estuarine and partly lacustrine in origin. Its nearness—some thirty miles—to the sandy coast of The Wash, with which it is in direct communication by means of the river systems and artificial "cuts," may account for the occurrence of some coast species.

There are also two small woods and a very small portion of original fen, neither of which, however, has at present been worked to any extent, and the occurrence of such forms as *Haplocnemus nigricornis*, *Cistela ceramboides*, and *Tillus elongata* is curious.

Anchomenus livens.—Several specimens in 1906.

Philonthus decorus.—The same.

Stenus opticus.—One specimen.

Dacne humeralis.—Local, but occurring in some numbers in dry fungoid growth.

Triplax russica.—Three specimens in 1881. I have not seen it since.

Omosita depressa.—Taken about 1880, and also in 1906.

Nemosoma elongata.—In the burrows of *Hylesinus*, under elm-bark of an old fence in 1906, a locality from which it has since utterly disappeared.

Tiresias serra.—Bred from larvæ taken from under bark of elm, willow, and maple. Common in the district.

Tetratoma fungorum.—One specimen, evidently some time defunct, in an old dried fungus.

Ægialia arenaria.—One specimen. Fowler says: "Sandy coasts . . . apparently generally distributed round the coasts of the whole kingdom."

Trox sabulosus.—Another species one did not expect to take here.

Silis ruficollis.—One specimen at Chatteris and one at Wicken.

Haplocnemus nigricornis.—A single specimen of this rare insect was taken in the district in 1906, but as it was not identified until some little time afterwards the exact locality was unfortunately not noted.

Tillus elongata.—A single specimen.

Opilo mollis.—Several specimens from one locality, on or near *Populus alba*.

Cistela ceramboides.—One example.

Mordella fasciata.—Not uncommon.

Brachytarsus fasciatus.—Occurs under bark of maple.

Ceuthorhynchus viduatus.—A few specimens by sweeping.

We are very much indebted to Dr. D. Sharp and Mr. C. R. Billups, of East Grinstead, for help in identifying species, and to the latter for many valuable hints as to the species to be looked for in the district.

The Priory, Chatteris.

NOTES AND OBSERVATIONS.

HYPSA BAUMANNIANA AND *H. CONSPICUA* UNDOUBTEDLY VARIETIES OF *H. SUBRETRACTA*.—Referring to the notes on the above in the February number of the 'Entomologist,' by my friend Mr. Berensberg, I can confidently state that *H. baumanniana* and *H. conspicua* are only varieties of *Hypsa subretracta*. I have reared this species during each of the last five years, and in every instance have obtained the three forms, and also other varieties. All three forms have been bred, and sent by me to the Tring Museum, and also, I believe, one example with the band on one hind wing only. With me the var. *conspicua* has been the rarest, the var. *baumanniana* common, and the slightly banded form the commonest next to the type. I have, however, only bred one *conspicua* male. As far as I can remember, the other specimens of this form have been females. I may also mention that the larvæ do not vary in the least, and the species is one of the commonest in Durban.—G. F. LEIGH, F.E.S., Durban, Natal, March 9th, 1907.

PIERIS NAPI VAR. *BRYONIAE* MALE?—The specimen of var. *bryoniae*, believed to be a male, and shown as such at the February meeting of the Entomological Society, I submitted to the examination of Dr. Chapman, who declares it to be only a female after all. In such a matter his decision is indisputable. I shall be obliged therefore if you will

allow the insertion of this correction with my expression of regret at the mistake.—F. E. LOWE.

INSECT FAUNA OF LINCOLNSHIRE.—I shall be very much obliged to the readers of the 'Entomologist' and other naturalists who can supply me with a list of any order of insects taken by themselves or their friends in Lincolnshire, to help me in completing the insect lists for the Victoria County History of Lincolnshire. Notes upon the commonest species will be acceptable. I may say, too, that the Lincolnshire Naturalists' Union is now publishing lists from the notes kept by me as the Entomological Branch Secretary, so that I shall be pleased at any time to hear from any one who collects in the county.—G. W. MASON; Burton-on-Humber.

THE INSECT FAUNA OF YORKSHIRE.—Another important addition to county faunal lists is that contained in the Victoria History of the County of Yorkshire. The insect section has been edited by Mr. G. T. Porritt, who also prepared the lists of Orthoptera, Neuroptera, Trichoptera, and Lepidoptera. The list of Hymenoptera is by Mr. W. D. Roebuck; that of Coleoptera by Messrs. E. G. Bafford and M. L. Thompson; and Mr. P. H. Grimshaw has drawn up the list of Diptera. Mr. Porritt states that the lists of Neuroptera and Trichoptera are largely based on the result of his own work during the past twenty years. The summary of these show that of the 71 British species of Pseudo-Neuroptera (excluding Psocidæ and Ephemeridæ), 37 occur in Yorkshire; 33 of the 53 British species referable to Planipennia; and 93 of the 167 British species of Trichoptera are found in the county. British Hymenoptera total something over 4000, but in Yorkshire only 582 species are so far known to occur; and of the 3276 species of Coleoptera credited to Britain, 1707 species have been observed. Lepidoptera is the order of insects most in favour almost everywhere, and this is perhaps especially the case in Yorkshire; anyway, from the summary of this list for the county we find that 1384 of the 2140 British species have been recorded.

INTERNATIONAL EXCHANGE AND INFORMATION BUREAU FOR LEPIDOPTERISTS.—The chief difficulty experienced by British collectors, when they emerge from their insularity, and seek "fresh woods and pastures new" on the Continent, generally is to get at the right sort of information with regard to localities. There are, of course, in France and in Switzerland, butterfly "centres" which are as well known and explored as the New Forest and Wicken Fen, and have been visited by generations of collectors since their discovery perhaps a half-century ago. But our knowledge of adjoining regions is as incomplete as ever it was; and, in the absence of any number of French lepidopterists who publish other than advanced scientific work in their periodicals, it is likely to remain so. I think, therefore, that many of us will welcome the announcement which has reached me from M. le Docteur A. Salis, and M. F. Braun, Officier de l'Instruction Publique, of the establishment by them at Royan, Charente-Inférieure, of an "International Exchange and Information Bureau for Lepidopterists," having no commercial object in view, but offering collectors at once the advantage of mutual introduction and facilities for exchanging specimens.

Should the venture prove successful—and I cordially recommend it to the notice of collectors on this side of the Channel—it is intended to collate and publish lists of the insects furnished, in the course of correspondence and exchange, by individual collectors from their respective localities, and in this way to arrive at a more precise knowledge of the distribution of species throughout France—a great part of which, so far as I have been able to find out during several years of research, is from the lepidopterist's point of view wholly unknown and unexplored. The gentlemen whose names I have mentioned will send full particulars on application, and these also comprise a list of all the *Macros* occurring in the neighbourhood of their beautiful town. Meanwhile, may I again ask any entomologists who may be visiting France during the coming season, kindly to let me have a list, with dates, of the butterflies (only) taken or observed by them?—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, April 21st, 1907.

BARRETT'S 'LEPIDOPTERA OF THE BRITISH ISLANDS.'—Mr. Adkin's cold douche has happily come too late to do much, if any, damage to the excellent work of Mr. Barrett, which will not be superseded during the present century. In compiling the index, we followed the author's own plan in his indexes to the separate volumes. Some one proposed to give the authorities for the names in the index. After due consideration, we came to the conclusion that this, which would greatly increase the bulk of the index and double the cost, would answer no useful end. The purport of an index is, not to repeat details given in the body of the work where all the authorities are given, but to direct to the page where they may be found. No suggestion was made concerning a specific index, which does not occur in any of our other works, where the indexes were prepared by the authors themselves, and it did not occur to us. We see at once the difficulty, not noticeable in the single volumes, where the indexes are short—the inconvenience of seeking the name of a species through forty-six closely printed columns. We therefore at once put in hand the compilation of an alphabetical index to the whole of the species, which will be issued as soon as ready.—THE PUBLISHERS.

COMPSOTATA, n. nom., pro CHARIDEA, Guen., Hmps. n., nec Dalman.—There is some confusion in the "nomenclators" respecting the generic name *Charidea*—particularly in Scudder's, which is the most generally consulted. As Zeller, in Agassiz (Lep., p. 15), correctly indicates, the name was first used by Dalman in 1816 (Vet. Ak. Handl., xxxvii. p. 225) as n. nom. for *Glaucopis*, Fabr., Latr. (nom. præocc.—non Gmel. nec Lacépède). *Charidea*, Guen. (Spéc. Gén. vi. [=Noct. ii.] p. 60, 1852) is also rightly cited by Marschall (p. 283); but he adds *Charidea*, Dalm., 1846 (*ex err.* for 1816), meaning to imply that Guenée's name is preoccupied, and this has resulted in Scudder's citing (Univ. Index, p. 65) "*Charidea*, Guen., 1846," while he leaves "*Charidea*, Dalm." without a date. Sir George Hampson, in his new volume (Cat. Lep. Phal., vi. p. 140) has accepted Guenée's use of the name as valid, restricting the genus to its type-species *elegantissima*, Guen. For this genus I propose the new name *Compsotata*, mihi, n. nom. = *Charidea*, Guen., Hmps. n. restr. nec Dalman, type *elegantissima*, Guen.—Louis B. PROUT; 246, Richmond Road, N.E., March 23rd, 1907.

CAPTURES AND FIELD REPORTS.

VANESSA ATALANTA.—During the first three weeks of February, 1907, *V. atalanta* made its appearance several times in a school-yard here. It flew vigorously during what sunshine there was, and kept to the sunny side of walls, opening and closing its wings while basking. This insect disappeared during a spell of frosty weather, and its retreat could not be discovered. On December 2nd, 1906, I saw *V. atalanta* several times, and again, on December 15th, I saw a specimen fly over a cliff-side.—G. RANDELL; Seacombe, The Parade, Barry, Glamorganshire.

BLATTA ORIENTALIS OUT OF DOORS.—Mr. W. Daws, of Mansfield, tells me that on March 29th, 1907, he took a female *B. orientalis* in a garden at a distance from any house, in a heap of garden refuse. It was very stupefied, and did not attempt to escape.—W. J. LUCAS; 28, Knights Park, Kingston-on-Thames.

VARIETY OF BREPHOS PARTHENIAS.—While collecting at Easter in Epping Forest, I was pleased to obtain a very pale straw-coloured example of *B. parthenias*, this being the first one I have seen of that colour.—C. H. WILLIAMS; 36, Dartmouth Street, S.W.

NOTES FROM THE NORTH-WEST FOR 1906.—My first field-day was on February 17th, the locality Delamere Forest. The purpose of the visit was to see if the scarcity of *Hybernia leucophæaria*, so noticeable in my experience since February and March, 1892, was still maintained. It was, for I only saw one moth, a male *H. marginaria* = *progemmaria*. The same lament applies to other spring Delamere species, as *Nyssia hispidaria* (which I have not seen since March, 1901) and *Anisopteryx æscularia*. *Phigalia pedaria* = *pilosaria* is about the only moth now which keeps up the ancient spring reputation of Delamere Forest. And this evident scarcity is not explained by tree-felling, for the scene of my observations on February 17th was the same as that of February 13th, 1892, when I picked off the oak trunks a long series of *H. leucophæaria*, including many melanic specimens. Nor has the scene, I believe, lost a single tree since then. I have taken melanic females of *P. pedaria* in Delamere Forest, but the only melanic male (almost black and unicolorous), I possess I captured at a Chester gas lamp. The unicolorous melanic form of *H. marginaria* is not only frequent at Delamere but throughout the Chester district.

I have little worthy of special record until I come to the month of June. That pretty silvery-white geometer, *Lobophora lobulata*, with its distinctive transverse lines, was common in the Forest in the month of April. At the Chester electric lamps I took a fresh and fine *Taniocampa opima* in the same month (April 22nd). This species is only recorded in our district list for Wallasey and Llandudno; therefore my capture supplies a missing geographical link. About the middle of May I obtained two fine melanic specimens—almost black—of *Tephrosia biundularia* at Delamere. In fact, the Chester district can fairly claim to be a melanic centre. I do not remember such a June for low temperature and absence of bright sunlight. Occasionally

there was a warm, sunny day, as on the 9th, when, in Delamere Forest, among other things I captured a worn *Ephyra punctaria*. On the 10th a fine example of this moth emerged in a breeding-cage from a larva beaten off an oak in the Forest, October 26th, 1905. *Lycæna ægon* was just appearing in its usual haunts at Delamere on the 30th. On July 14th the butterfly was plentiful and in fine condition. At sunset I could have taken scores as they rested, head downwards, on an unusually prominent furze bush. Some of the females were beautifully "shot" with blue, particularly on the lower wings, the nervules marked out in black. A few of the females had the marginal red spots almost obliterated, whilst one specimen is a unicolourous black, relieved only by a few scanty blue hairs in the region of the thorax. Five *Canonympha typhon* (*davus*) var. *philoxenus* = *rothliebi* were seen, June 30th, and eight only were counted on July 14th, on the principal ground where the butterfly was plentiful a few years ago. The diminished numbers are doubtless due to over-collecting, and the time seems close at hand when *typhon* will cease to appear among the records of Delamere. *Hepialus hectus*, fine and fresh, were flying in numbers over isolated spots in the forest clad with bracken (the food plant) on July 21st from 8.30 to 8.45 p.m. In some of the specimens the silvery spots on the upper wings are unusually numerous and conspicuously large. The captures included only one female—a very sober-coloured moth in comparison with the males.

It is remarkable that *Coremia ferrugata* should be common in Denbighshire and comparatively scarce in the Chester district. The Cheshire specimens are larger than those of Denbighshire, and the transverse central reddish bar across the upper wings is disproportionately broader. *Numeria pulveraria* is a moth I have never taken in Cheshire, but several specimens were captured in June in the Wrexham-Llangollen district (Denbighshire) by Mr. B. Thompson. Especially when reared from the egg, *pulveraria*, with its umber ground (upper wings) crossed by a wide, transverse dark bar, is one of the most striking of British geometers. In closing my notes on North Wales I ought to mention that dingy skipper *Nisoniades* (*Thanaos*) *tages*, which was fairly common in June in its Flint and Denbigh haunts. Mr. B. Thompson found *L. argiolus* plentiful in May near Wrexham (Denbighshire), but I failed to meet with a second brood in August. The butterfly, therefore, appears here to be single-brooded.

At the Chester electric lamps frequent windy nights and low temperatures interfered with collecting in June and July. Still, a beginner could have made some welcome captures. Among these, in June, were *Smerinthus ocellatus*, *S. populi*, *Dicranura bifida*, *Notodonta ziczac*, *Miana strigilis* (melanic forms culminating in the var. *athiops*), *Xylophasia hepatica*, *Hadena thalassina*, *Habrostola triplasia*, *Amphidasys betularia* (plentiful, but including only a couple of types), and *Schenobius forficellus*; in July, *N. dictæa* (*N. dictæoides* appeared as early as May 27th), *Acronycta leporina*, *Caradrina morpheus*, *C. alsines*, *C. blanda*, *Plusia chrysitis*, *P. iota*, *P. pulchrina*, another type *betularia*, and melanic forms of *Tortrix podana*, the latter probably reared on the elms near by. *Spilosoma menthastri* was unusually abundant in June and July at the lamps. On the other hand, I found *S. lubricipeda* much less in evidence. I took a female *S. menthastri* on the night of

June 11th. She laid a large number of eggs, which hatched in a fairly warm kitchen on the 18th. The larvæ—fed on plantain, and from which I hoped to get melanic forms—all began, unexpectedly, to pupate on July 14th, when I happened to be from home; and, as they suffered in the change from want of space, they died in the pupa state, except a solitary crippled and typical imago which emerged July 31st. Other forcing operations, in the same room, with *Nemeophila plantaginis* were more successful. Mr. J. Thompson kindly gave me about seventy eggs from the usual May–June brood. The parents were reared from larvæ taken in 1905 on Minera Mountain, Denbighshire. The eggs given me hatched June 29th and 30th, and the larvæ, fed on plantain, spun up on various dates in August. The first imago—a fine female—appeared August 21st and the last on December 8th. Every egg, I believe, resulted in a moth at some time or other between these dates. There was only a single departure from the typical insect—a male, in which the black markings were unusually and largely developed. I noticed, in forcing this second brood of *plantaginis*, that, as the outside temperature of the season fell, the emergence from the pupæ became less frequent and the larvæ were slower in spinning up. Larvæ, pupæ, and perfect insects, consequently, occurred together, even in November. I have seen the same results when forcing second broods of *Arctia caia*. Before leaving my captures at the electric lamps, I may mention a melanic specimen of *Phibalapteryx lignata* = *vittata* (August 23rd), *Anchocelis lunosa* (plentiful at the end of August and beginning of September), *Xanthia xerampelina* (August 31st), and, in September, *Epunda lutulenta*, *Tapinostola fulva* (with red forms), *X. silago*, *X. gilvago*, *Eugonia* (*Ennomos*) *tiliaria*, and *E. fuscantaria*. Among the numerous males a solitary female *E. tiliaria* turned up on the night of September 12th, from which I obtained a lot of fertile eggs.

Fine sunny days marked the beginning of August until the 8th, when I went for a fortnight's stay to Lancaster. The temperature began to drop until the 10th, when, as I have so frequently observed, there is—or about that date, and on towards the middle of the month—an unmistakable break-up of the weather. In this case, stormy south-west winds, with frequent heavy rains, continued until the 14th, when, the sun shining once more, I went for a day's collecting on Arnside Knott. The following butterflies were observed:—*Argynnis aglaia* (in good condition), *A. adippe* (so battered as to be hardly recognizable), *Erebia athiops* = *blandina* (chiefly worn and chipped by the recent weather), *Satyrus semele*, *Epinephele ianira*, *Thecla quercus*, *Cænonympha pamphilus*, *Lycana astrarche* var. *salmacis*, but nearly all bearing traces of age or of stormy weather. Other captures were *Cosmia trapezina* (at rest, and including the reddish form), one green and one almost black *Hypsipetes elutata*, *Crambus hortuellus*, and *C. inquinatellus*. Larvæ of *Cucullia asteris*—a species new to Mr. Forsythe's district list (Entom., xxxviii., p. 86)—were taken off flower-heads of golden-rod. Seeing a thunderstorm coming up from the south-west about midday, my companion and I worked on until we barely gave ourselves time to reach the foot of the knott, or hill, where, in some friendly stables, we spent the time until the storm was over in admiring the carriage-horses, &c.—things getting rarer and rarer in these days of motor cars! The storm over—and a fierce one

it was—we adjourned to the Crown Hotel, Arnside, which, after a good feed, we left again, and returned, with the sun shining once more, to our hunting-ground on the knott. Another visit, on the 16th, turned out to be on a cool, showery day, with north-west winds. I saw a few *blandina* and *T. quercus*, but the season was about over for the butterflies. Off tree-trunks I picked a worn and unrecognizable *Eupithecia*, an equally worn *Scoparia*, and, off a fern, a fine example of *Tortrix forskaeana* in which the median fuscous blotch (upper wings) is much more developed than in our Chester specimens. On this occasion I again took larvæ (three) of *C. asteris* from golden-rod.

In the immediate vicinity of Lancaster I noticed the following moths:—*Bryophila perla*, *Polia chi* (at rest on stone walls), and, on tree-trunks, the pale form of *Cidaria truncata-russata*, that is, with the central portion of the upper wings white—the true *russata*, I believe. When I got home, on August 22nd, I found the smoke-coloured form of the moth about Chester (*perfuscata*), and, at Delamere, the form *immanata*, that is, with the central and basal portions of the wing black-brown and the intervening transverse band distinctly brown. All these and subsequent forms I look upon as the same species, differing only as to times of appearance (*perfuscata*, for example, appears twice in the season at Chester), difference in coloration and situations. To continue the list of “forms” I adopt for cabinet purposes I would cite *comma-notata*, with the upper wings centrally suffused with russet, and *marmorata* (brown markings only, on a whitish-grey ground), the latter leading closely up, in general appearance, to *Cidaria suffumata*. Before leaving my list of insects for the Lancaster district, I ought to mention a handsome form, hitherto entirely unheard of by me, of *Gonopteryx rhamni*, which that veteran entomologist, Mr. G. Loxham, showed me—a male with the tips of the upper wings broadly and clearly marked off with orange-scarlet. Mr. Loxham informed me this was a very local race of the butterfly, and that all the specimens captured in the locality were not always so definitely orange-tipped. Here I would express my warmest thanks to Mr. Loxham and to Mr. C. H. Forsythe for the kindness and help they extended to me while at Lancaster. Among the many favours received at the hands of Mr. Forsythe was a good look at his fine collection.

But my chief points of interest at Lancaster were, first, what was the form, there, of *Aplecta nebulosa*? and, secondly, the forms of *Boarmia repandata* and *B. rhomboidaria*? I found that a longitudinal line for the three species, drawn from South Wales, through Chester, on to Lancaster, and continued northwards, crossed the melanic centre in Cheshire, that north and south of Cheshire the moths became paler. Progressive melanism in these species appears to extend from this centre eastwardly. The same remarks apply to *A. betularia*, black forms of which have been taken near Berlin, only that this melanic direction now occupies a band, or zone, which, in the case of *A. betularia*, appears to have covered the greater part of Britain within the last fifty years.

In conclusion, I may refer to the abnormally hot weather of 1906 from August 22nd till the end of the first week in September, con-

ferring upon August the distinction of being the hottest for twenty-two years. On September 1st the temperature in England was declared to be "hotter than at the Azores." It was too hot in the daytime for collecting, and I contented myself with searching for well-marked females of the butterfly *L. icarus-alexis* (last brood), in a well-known haunt—but about six o'clock, p.m., after the sun went down. This was an easy matter, for the butterflies were at rest on withered grass and flower-heads, and, as in the case of *L. agon*, all head downwards.—J. ARKLE; Chester.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, March 6th, 1907.*—Mr. C. O. Waterhouse, President, in the chair.—Mr. John C. Moulton, of The Hall, Bradford-on-Avon, Wilts.; Mr. W. Schmassman, of 2, Kinnoul Villas, Freezywater, Waltham Cross; and Mr. R. J. Tillyard, B.A., The Grammar School, Sydney, New South Wales, were elected Fellows of the Society. — The President proposed the following resolution, seconded by Professor E. B. Poulton, D.Sc., F.R.S., &c.: "That this Society, being informed that a proposal has been made that children in our schools be instructed to collect objects of Natural History for the purpose of exchanging them for similar objects collected by school-children in our Colonies, deprecates the adoption of any such system." After a discussion, in which the destructive and fatal results to our national fauna of indiscriminate collecting by inexperienced persons was commented upon, the resolution was adopted unanimously.—Professor E. B. Poulton, F.R.S., exhibited male specimens of the Danaine butterflies, *Amauris egialea*, Cram., and *Limnas chrysippus*, collected at Ibadan, near Lagos. The interest of the specimens lay in the fact that the scent-producing patch near the anal angle of the hind wing had been eaten out on both sides, although only a minute portion of any other part of the wing-surface had been attacked, the facts appearing thus to tell strongly against the view that specially protective (aposematic) substances are, as some have supposed, concentrated in the male scent-glands.—Dr. F. Dixey, specimens of *Teracolus achine*, Cram., and *Belenois severina*, Cram., bred and captured at Salisbury, Mashonaland, by Mr. G. A. K. Marshall. The exhibit showed that in both species the appearance of the wet-season phase could be induced under artificial conditions in a brood that should normally have belonged to the dry-season form. The specimens of *B. severina* also exemplified the effect of moisture alone as contrasted with moisture and heat.—Mr. Selwyn Image brought for exhibition an aberration of *Odezia atrata*, L., taken by Dr. G. B. Longstaff at Mortehoe, North Devon, on June 26th, 1906. The specimen differed very obviously from the ordinary form. The forewings were rather sharply angulated at the apex instead of rounded, and the colouring generally suggested a tendency to albinism.—Mr. W. J. Kaye exhibited a series of the genus *Heliconius*, arranged to illustrate Riffarth's division of the group by a secondary sexual character, a result of this being the discovery that what had hitherto been regarded as a

single species consisted in reality of two.—Mr. W. E. Sharp showed a small collection of Coleoptera intended to illustrate the tendency of some species to micromorphism, and gave an account of the causes of which these small forms were the result.—Mr. H. St. John Donisthorpe also exhibited, in further illustration of this characteristic, a number of similarly stunted specimens.—Mr. Hamilton Druce, a case of butterflies illustrating the interesting Lycænid genus *Mimacraa*, including two groups, the one mimicking the Danaine butterflies, the other the Achæne.—The Rev. G. A. Crawshay, M.A., read a paper, illustrated by lantern slides, on “The Life History of *Tetropium gabrieli*, Weise”; Dr. T. A. Chapman, M.D., F.Z.S., read a paper, illustrated by several exhibits, on “Some Teratological Specimens”; he also, with Mr. G. C. Champion, F.Z.S., communicated a paper on “Entomology in North West Spain”; Mr. Robert Shelford, M.A., F.L.S., a paper on “The Larva of *Collyris emarginatus*, Dej.”; Mr. Malcolm Burr, B.A., F.L.S., “A Preliminary Revision of the Forficulidæ and Chelisochidæ”; Mr. Hamilton H. Druce, F.Z.S., “Descriptions of some New Butterflies from Tropical Africa”; and Mr. Arthur M. Lea, F.E.S., “A Catalogue of the Australian and Tasmanian Byrrhidæ, with Descriptions of New Species.”

Wednesday, March 20th.—The President in the chair.—Dr. Ernest Edward Octavius Croft, of 28, Hyde Terrace, Leeds; Mr. Felix M. Dames, of Berlin, W.; Mr. Thomas Frank Partridge Hoar, of Quex Lodge, West End Lane, Hampstead, N.W.; Professor Dr. A. Jacobi, Director of Zoology and Anthropology in the Ethnographical Museum of Dresden; and Mr. Harold J. White, of 42, Nevern Square, Kensington, S.W., were elected Fellows of the Society.—It was announced that the Rev. F. D. Morice, M.A., and Professor E. B. Poulton, D.Sc., M.A., F.R.S., would represent the Society at the forthcoming celebrations at Upsala and Stockholm.—Dr. F. A. Dixey exhibited several species of *Phrissura* and *Mylothris*, illustrating the remarkable parallelism between different forms of the two genera, a correspondence believed by the exhibitor to have a mimetic significance, the mimicry being probably of the Müllerian kind.—The following papers were communicated:—“Studies in the Tetriginæ (Orthoptera) in the Oxford Museum,” by Joseph L. Hancock, M.D., F.E.S.; “A List of the Coleoptera of the Maltese Islands,” by Malcolm Cameron, M.B., R.N., and Dr. A. Camara Gatto; “The Life History of *Spindasis lohita*, Horsf.,” by John C. Kershaw; “On the Egg Cases and Early Stages of some South-Chinese *Cassididæ*,” by John C. Kershaw and Frederick Muir; “A Life History of *Tesseratoma papillosa*, Thunb.,” by John C. Kershaw, with “Notes on the Stridulating Organ and Stink Glands,” by Frederick Muir; “The Vinegar Fly (*Drosophila funebris*),” by Ernest E. Unwin, communicated by Professor L. C. Miall, F.R.S.; “On the Structure and Life History of the Holly Fly,” by Professor Louis Compton Miall, F.R.S., and T. H. Taylor; “A Note on *Xanthorrhoe ferrugata*, Clerck, and the Mendelian Hypothesis,” by Leonard Doncaster, M.A., F.E.S.

Wednesday, April 10th.—The President in the chair.—Mr. Sydney R. Ashby, of 119, Greenvale Road, Eltham Park, Kent; Mr. Arthur Bulleid, F.S.A., of The Old Vicarage, Midsomer Norton, Somerset;

Mr. Bernard H. D. Harrison, of Claremont, Ashleigh Road, Barnstaple; and Mr. Charles Fielding Johnson, of Mayfield, Binnington Crescent, Stockport, were elected Fellows of the Society.—Dr. F. A. Dixey exhibited specimens of Pierinæ belonging to the genera *Teracolus* and *Huphina*. The exhibit was intended to illustrate the fact that in species of which the wet-season phases were very distinct from each other, the corresponding dry-season phases often could only be discriminated with difficulty.—Mr. G. C. Champion showed, on behalf of Mr. J. Edwards, five forms of *Osphya*, together with certain other species occurring at the same time and place, and which, having regard to gait and appearance, resemble them more or less closely. It was not suggested that these resemblances are protective. Attention was also drawn to an important function of the hind legs of the male, namely, to secure him in position at the time of pairing.—Mr. H. J. Carter showed a microscopic slide, prepared to demonstrate that the antennæ of the genus *Trachiscelis* have eleven joints, and not ten as hitherto described.—Mr. Kenneth J. Morton communicated a paper on "Odonata collected by Lt.-Colonel C. G. Nurse, chiefly in North-Western India."—Mr. W. J. Kaye communicated a paper on "The Life History of *Cydimon (Urania) leilus*," by L. Guppy, Junior, which was followed by a discussion on the migration habits and classification of the species. Commander J. J. Walker said that he had met with it at Panama, where it was believed popularly that the insect made daily migrations from one side of the isthmus to the other. Mr. J. W. Tutt said that Mr. Guppy's description of the egg at once determined that the species should not be included in the Geometrinæ. The details suggested that it belonged to the butterfly stirps. The President and other Fellows also joined in the discussion.—H. ROWLAND-BROWN, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Thursday, March 14th.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. South exhibited the various named forms of *Nonagria geminipuncta*.—Mr. Tonge, photographs of a female *Hybernia marginaria* and a male *Phigalia pedaria*, both at rest on trunks, the former most inconspicuous, the latter very conspicuous; also the former insect set on the bark as taken.—Mr. Newman, bred series of *Piusia bractea* from Aberdeen, and an example from Fermanagh.—Mr. R. Adkin, series of *Hadena protea* from Rannoch and South England, the former specimens being much less green and much brighter.—Mr. Turner, the various named forms of *Pararge mæra* from various Continental localities, and read a note on the directions which the variation takes in this species, pointing out an extreme form of var. *adrasta* taken by him in the Pyrenees.—Mr. Harrison, a series of the same species from Meiringen, including a very fine var. *triops*.—Mr. Turner, a number of species taken in Switzerland by Mr. Harrison in 1906, including *Boletobia fuliginaria*, *Gnophos glaucinaria*, *G. pullata*, *Psodos quadrifaria*, *P. alpinata*, &c.—Dr. Chapman, living specimens of *Thais polyxena* from the South of France.—Mr. B. Adkin, specimens of the following species, being transition forms between the typical forms and the named varieties: *Boarmia repandata*, *B. abietaria*, *Eupithecia venosata*, and *F. pulchellata*.—Mr. Fremlin, a large number of specimens bred

by him during a series of experiments to show the effects of physical and chemical agencies on pupæ, and read a paper giving a summary of the results obtained.—HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — *March 5th, 1907.*—Rev. C. R. N. Burrows exhibited *Nemoria viridata*, with microscopic slides of larva, ovum, and pupa, in illustration of his paper on the species.—Dr. T. A. Chapman, *Leioptilus carphodactylus*, a species new to the British list, received from Mr. Purdy, of Folkestone; also a dark specimen of *L. tephrodactylus*, and *Peronea cristana*, vars. *gumpiana* and *subcapucina*; also a pupa of *Hastula hyerana* with mandibles of larval pattern.—Mr. J. A. Clarke, a series of *Ematurga atomaria*, including many dark brown unicolorous forms.—Dr. G. G. C. Hodgson, *Nemoria viridata*, showing variation with regard to white lines on fore wings; one specimen showed only one line (= Linnean type), in another the lower end of outer line was bent outwards towards the anal angle, and in a third this line was markedly crenulate.—Mr. L. B. Prout, *Nemoria porrinata* (Zeller), from South Europe, apparently indistinguishable from *N. viridata*, but said to be separable by brown spots on costa and brown fore legs.—Mr. P. H. Tautz, *Diphthera orion* bred from New Forest, including a specimen with brown marbling much accentuated and the green ground darker and duller than usual.

March 19th.—Messrs. F. B. Cross, D. Langford, and E. Reid were elected Fellows of the Society.—Mr. A. Harrison exhibited a photo of two pupæ of a large Tineid *Binsitta* (? sp.) from Upper Burmah, which showed a striking resemblance to the head of a small snake (*Lycodon aalicus*) common in Burmah; of two pupæ received, one resembled in colour and marking the type, and the other a striking variety of the snake in question.—Dr. G. G. C. Hodgson, a remarkable *Nemoria viridata*, lent for exhibition by Mr. Sidney Webb, with the cilia of all wings and the costal nervure of a deep green colour; also a larva of *Erebia blandina*, hibernated in captivity.—Mr. A. W. Mera, a living female *Nyssia lapponaria*.—Mr. L. B. Prout, *Melanippe procellata* var. *inguinata*, from India and Japan, and *Mesoleuca casta*, from Japan.

April 2nd.—Mr. A. H. Shepherd was elected to membership.—Mr. W. J. Cox exhibited a coloured plate printed on paper which, while presenting the glazed surface of a hot-pressed paper, was said to be free of the perishable properties of the latter.—Mr. H. M. Edelsten, larva and pupa of *Lithosia muscerda*, reared *ab ovo* in captivity.—Mr. J. H. L. Grosvenor, a long and variable series of *Phigalia pilosaria* from Reigate district, including a melanic male with a metallic green tinge on fore wings.—Mr. L. W. Newman, a bred series of *Polygonia c-album* from Monmouth; also a cocoon of *Dicranura bicuspis*, formed between two patches of lichen, the edges of which were drawn over the cocoon.—Mr. Newman reported that larvæ of *Arctia caia* were practically non-existent in localities in Kent where they were usually abundant; the few larvæ found were unusually advanced, suggesting that the hot autumn had carried them past the usual stadium, and the majority had died during the winter in consequence.

April 16th.—Mr. A. W. Mera exhibited male and female *Nyssia lapponaria*, bred this spring.—Mr. L. W. Newman, half-fed larvæ of *Argynnis euphrosyne* and larvæ of *Argynnis aglaia* and *Dryas paphia*, apparently in second instar. In continuation of his remarks at the previous meeting, Mr. Newman reported that at Sunderland larvæ of *Arctia caia* were practically full-fed and very scarce, while at Nottingham, where they are abundant, they are exceptionally backward for the time of year.—In the course of a casual discussion re *Orgyia gonostigma*, Mr. Edelsten mentioned that he had observed in the fens that in the spring most of the larvæ left the willow bushes on which they had hibernated and fed up on various low plants.—S. J. BELL, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*March 18th, 1907.*—Mr. G. T. Bethune-Baker, President, in the chair.—The Rev. C. F. Thornehill showed several interesting Lepidoptera: *Agrotis neglecta*, Hb., from Burnt Wood, North Staffordshire, a specimen of the rare so-called yellow variety discovered there by Mr. F. C. Woodforde; *Cosmia paleacea*, Esp. (*fulvago*, Hb.), which emerged unlooked-for in his breeding-cage from a North Shropshire larva, and which he believed was new to the county; a fine variety of *Helotropa leucostigma*, Hb. (*fibrosa*), which was taken at sugar in his own orchard at Whitchurch, Salop, and had been illustrated by Barrett; *Ephyra pendularia*, Cl., var. *subroseata*, from Burnt Wood; and *Ortholitha cervinata*, Schiff, a remarkable variety bred with others from North Shropshire.—Mr. G. H. Kenrick, a number of Pyralidæ which strongly resembled certain striking and very various Lepidoptera belonging to other families which he also exhibited; it certainly seemed a good case of either Batesian or Müllerian mimicry.—Mr. J. T. Fountain, a very fine case, which he had made and filled with well-arranged insects with the idea of hanging it in Board Schools in order to interest the children in entomology.—Mr. G. T. Bethune-Baker, a long series of *Lycena arion*, L., from many localities, and pointed out how dark many of the Alpine specimens were, and that some Cornish ones were the brightest coloured of all.—Mr. A. H. Martineau read a letter from the Rev. E. N. Bloomfield referring to his (Mr. Martineau's) exhibit of *Xestophanes potentillæ* on November 19th last, and pointing out that he was not quite correct in saying that it occurred in Devonshire only, as he had taken it at Battle and near Guestling, Hastings.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Transactions of the City of London Entomological and Natural History Society for the Year 1906. Published by the Society, London Institution, Finsbury Circus. Pp. 45.

In the Presidential Address Mr. Mera remarks on the results obtained from a cross-pairing of *Nyssia lapponaria* female and *N. zonaria* male. The disappearance of insect life from the neighbourhood of large towns is adverted to, and there are some exceedingly interest-

ing observations on that bygone entomological locality, Hammersmith Marshes. Mr. L. B. Prout contributes an important paper on "The *Rheumaptera hastata* group," occupying twelve pages, from which we gather that the association of the British species so generally included under *Melanippe* is not in the least correct. Some of these species have to go in one genus and some in another, but the species *tristata*, *alternata* (*sociata*), &c., are referred to *Epirrhoë*, Hübn., and the only British species of *Rheumaptera*, Hübn., is *hastata*. The European *luctuata*, Schiff., which has been considered to be generically associated with *hastata*, is here supposed to find its most probable allies in *picata*, Hübn., *amniculata*, Hübn. (*unangulata*, Haw.), &c., and should therefore be placed in *Euphyia*, Hübn. Three local races, and four aberrations of *hastata* are discussed.

There is an excellent paper by Dr. Chapman on the "Differentiation of *T. tridens* and *T. psi* in the Imaginal Stage." Probably we have no other two Noctuid moths more difficult to distinguish in the perfect state than these two Acronyctids, consequently they are frequently mixed in collections. Of course in the larval state the differences are so obvious that separation is then quite simple. Dr. Chapman affirms that there are many differences between the imagines of one species and the other, but at the same time he admits that there are no differences whatever. This means that to the practised eye certain peculiarities of form, colour, and marking are recognized as belonging to this or to that species; but these distinctions are so subtle that they cannot be conveyed in a differential description. Until one has acquired the necessary experience, it seems to be advisable to admit only specimens reared from larvæ to one's series of each species. However, where captured specimens happen to be males, correct identification may be assured by examination of the genitalia, and the author illustrates this point by two helpful plates, which by his courtesy, and the permission of the Society, we have here reproduced.

Another paper of very great interest is that by Mr. Sich, entitled "Notes on the Micro-Lepidopterous Fauna of the London District Tineina."

Eleventh Annual Report of the State Entomologist of Minnesota for the Year 1906. Pp. 87.

THIS is the Fifth Annual Report of the State Entomologist, Dr. F. L. Washburn. Among other matters of interest in this report is a chapter on the Cabbage Maggot and other pests, and accompanying this is a coloured plate, showing some of the enemies of the said maggot. An illustrated Entomological Calendar should be useful to farmers and fruit-growers.

Butterflies of Hongkong and South-East China. By J. C. KERSHAW, F.E.S., F.Z.S. Parts iv. and v. (London agent: R. H. Porter.)

Part iv., pp. 65-82, treats of the Lycænidae, and pages 83-86 are occupied with General Notes. Plates viii. and ix. are also comprised in this instalment. Part v., pages 87-118, deals with the Pierinæ and Papilioninæ and is illustrated by Plates x.-xiii. Parts i.-iii. of this work were referred to, *ante*, p. 48.

Transactions of the Hull Scientific and Field Naturalists' Club for the Year 1906. Edited by THOMAS SHEPPARD, F.G.S. Vol iii. Part iv. Pp. i.-viii., 247-313. Hull: Brown & Son, Ltd., 1907.

"Hymenoptera of the East Riding of Yorkshire." By W. Denison Roebuck, F.L.S.; and "Bygone Hull Naturalists. iii.—William Spence," with portrait, are the chief entomological items.

Christ's Hospital, West Horsham, Natural History Society: Fourth Annual Report for the Year 1906. Pp. 34.

WE are pleased to see that entomology is in favour among the members of this Society. Since its inauguration in 1903 the lepidopterists of the entomological section have been more and more active during each season. The number of species of Lepidoptera taken in 1906 exceeds the total of the previous year by thirteen, and is sixty-nine species ahead of the tale of 1903. Among the more notable insects obtained last year were *Deilephila livornica*, "found by W. P. Nason on June 6th in Thornton A Changing-room"; *Charocampa celerio*, "picked up by H. F. Clark, on the asphalt behind Coleridge, on October 16th"; and *C. nerii*, "found on September 6th, near Fulford's, by a man who, while engaged in trimming a hedge, knocked it out and then 'put his foot on it to keep it quiet.'" Of *Heliothis peltigera*, "one specimen was found by Willey, in the Cloisters, on May 31st," and the captor of this species has also recorded an example of *Acidalia rusticata*, taken on July 27th; previous Sussex localities for this insect are Lewes and Brighton.

There are four plates, reproduced from photographs, and one of these illustrates the three Sphingid moths just mentioned.

Proceedings of the Hawaiian Entomological Society. Part 2, Pp. 37-78. Honolulu, December 1st, 1906.

CONTAINS an account of the Proceedings at the six meetings held January 4th, 1906—June 7th, 1906, together with the Presidential Address and the following papers:—"A New Method of Relaxing and Cleaning Specimens," by Mr. R. C. L. Perkins; "Life-history Notes and Observations on Three Common Moths," by Mr. O. H. Swezey; "Notes on Hawaiian Wasps, with Descriptions of New Species," by Mr. R. C. L. Perkins (abstract); "Note on *Tomocera*, a Genus of Scale-bug Parasites, with Description of a New Species," by Mr. R. C. L. Perkins.

In his address the President gave "an account of the endemic insects that are found on that part of the Honolulu Mountains known as Tantalus, and its adjacent slopes."

The three species of moths mentioned in Mr. Swezey's paper are *Plusia chalcites*, Esp., *Spodoptera* (*Caradrina*) *exigua*, Hübn., and *S. mauritia*, Boisd. Referring to *S. exigua*, the author states: "It is not nearly so common on these Islands as *S. mauritia*. I have found it on only two occasions. The first was at Pahala, Hawaii, December 5th, 1905. A large number of larvæ of all sizes were found feeding on castor-oil plants. Several batches of eggs were also found."

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NEW AFRICAN ZYGÆNIDÆ.

BY DR. K. JORDAN, F.E.S.

1. *Anomæotes triangularis*, spec. nov.

♂. Upper side of body black, thorax and base of abdomen partly tawny; under side yellow. Fore wing ovate-triangular, proximal half, except costal margin, tawny, rest black; four subcostals, the first connected with the costal, the other three stalked together; upper angle of cell much produced, truncate. Hind wing small, triangular, semi-transparent like fore wing, black, costal margin, cell, and abdominal edge yellow. Under side more extended tawny yellow, the hind wing being entirely of this colour, except a distal marginal band of about 2 mm. width, narrowing almost to a point at anal angle. Length of fore wing 12 mm., of hind wing 7 mm.

Hab. Sierra Leone. One male in the Tring Museum.

2. *Epizygæna procroides xanthosoma*, subsp. nov.

♂ ♀. Abdomen pale yellow, except base and tip.

Hab. Uganda, British East Africa, Somaliland, and Abyssinia. A series in the Tring Museum; also in the British Museum.

3. *Epizygæna microsticha*, spec. nov.

♂. Body above green-black; sides of pronotum and of abdomen, a spot on the patagia, the spots of the fore wing, and the hind wing, yellow; under side of tibiæ yellowish, of abdomen dark blue. Fore wing above pale dull blue, with darker edges; six small spots, two near base, the anterior one being elongate, one in middle of cell, one below cell, a fifth at apex of cell, and a sixth transverse, parallel with distal margin. Hind wing with narrow black distal border. Under side of fore wing yellow, the spots of upper side indicated, the costal and distal margins blue-black. Length of fore wing 9 mm.

Hab. Grahamstown, Cape Colony. One male in the British Museum.

4. *Epizygana lateralis*, spec. nov.

♂. Body dark blue, sides of prothorax, the patagia, and the spots of the fore wing yellow; a row of confluent lateral spots on abdomen deep red; upper side of anterior femur and under side of anterior and median tibiae and tarsi yellowish. Fore wing purplish blue, greenish blue at the apex; five spots, the first large, rounded behind, reaching close to costal edge, second and third in middle, close together, the third being round, the fourth at apex of cell, also round, the fifth transverse, submarginal. Hind wing red, semi-transparent, costal edge yellow, distal edge very narrowly black, anal angle rounded; distal margin more distinctly incurved than in the other species of *Epizygana*. Length of fore wing 13 mm.

Hab. Natal. One male in the British Museum.

5. *Saliunca difformis*, spec. nov.

♂. Body greenish blue-black, a spot on the patagia and the sides of the abdomen dirty white; the posterior abdominal segments slightly iridescent. Upper side of fore wing dark bronze-green, purplish from base to disc; a basal streak, a rounded or quadrate spot at apex of cell, and a more or less distinct spot between M^1 and M^2 dirty white. Hind wing purplish blue-black, like the fore wing slightly glossy; usually a streak behind cell and another at abdominal margin transparent; a spot at apex of cell dirty white. Under side greener than upper, the white basal streak of fore wing longer, the base of the costal margin of fore wing and the base of hind wing from abdominal margin into cell also more or less dirty white.

♀. Body greenish blue-black, without white markings. Wings also without white spots. Upper side purple-green, bronze-green at apex and distal margin, a little more glossy than in male; fringe purple. Hind wing blackish blue. Under side uniformly bronze-green, slightly bluish, abdominal edge of fore wing and the fringe purplish. Cell of hind wing truncate in male and female, the cross-vein between costal and subcostal not being angulate. Length of fore wing 12 to 18 mm.

Hab. Unyoro, and, in a slightly different form, also in British and German East Africa. The sexes have repeatedly been caught *in copula*.

6. *Saliunca assimilis*, spec. nov.

♂ ♀. Sexes similar. Body bluish bronze-green, without white markings. Upper side of wings more glossy than in *S. difformis*; fore wing bronze-green, with white spot at apex of cell, the male bearing a second spot between the median veins. Hind wing green-blue. On under side both wings bronze-green, bluish towards base. Neuration as in *S. difformis*.

Hab. Fort Johnstone, Nyassaland, January–February, 1896 (Dr. Percy Rendall). A pair in the Tring Museum.

7. *Saliunca nitens*, spec. nov.

♀. Upper side of thorax and fore wing glossy green, slightly bluish; upper side of abdomen and hind wing purplish blue. Under

side of body green, of wings blue; apex and costal edge of fore wing glossy green. Fore wing with small white spot at apex of cell.

Hab. Unyoro, and Mpwapwa, German East Africa. Two females in the Tring Museum.

Perhaps only a geographical form of *assimilis*.

8. *Saliunca glennia*, spec. nov.

♂ ♀. Body dark blue-green; abdomen of male ventrally at the sides with a row of white spots. Upper side of fore wing glossy bluish green, with white spot at apex of cell, the spot being minute in female. Hind wing dark bluish bronze-green, in male with small white spot at end of cell. Under side blue, the white spots rather larger than above.

Hab. Salisbury, Mashonaland, December, 1900 (G. A. K. Marshall). In the British Museum a pair found *in copula*.

9. *Saliunca ventralis*, spec. nov.

♂. Like *S. styx*, Fabr. (1775), but the under side of the abdomen creamy white, except the last segment.

Hab. Entebbe, Uganda, September 7th (G. Degan). One male in the Tring Museum.

10. *Saliunca mimetica*, spec. nov.

♂ ♀. Superficially resembling *Netrocera setioides*, Feld. (1874). Body greenish black, head brownish; upper side of thorax, except a mesial stripe, and fore wing ochraceous. Distal margin of fore wing broadly black purplish, this band produced basad below cell. Hind wing black, yellowish grey in front. Under side like upper, but cell and costal margin of hind wing ochraceous. Apex of cell of hind wing angulate between c and sc².

Hab. Sapele, Niger (F. W. Sampson), one male in the British Museum; a female from Upoto, Congo, in the Tring Museum.

11. *Neurosymploca affinis*, spec. nov.

♂ ♀. Similar to *caffra*, L. (1758). Frons unicolorous; the red spots behind eye and on pro- and mesonotum much longer, transverse; palpi, legs, and under side of abdomen yellowish white, often reddish. Spots of fore wing as in *caffra*, usually edged with white. Hind wing of most specimens basally transparent. Anal tergite of male on each side with a long process, which is absent from *caffra*; process of penis-sheath straight, only the extreme tip hooked, the process being crook-shaped in *caffra*.

Hab. Knysna, Cape Colony, and Cape Town. A series in the Tring Museum.

CHALCONYCLES, gen. nov.

♀. Near *Metanycles*, Butl. (1876). Antenna flabellate, being proximally dentate and distally pectinate. Palpi small; tibial spurs short, hind tibia with one pair. Neuration as in *Metanycles*, but the

first and second subcostals of fore wing more proximal, and first and second radials of hind wing absent.

12. *Chalconycles vetulina*, spec. nov.

Upper side of body and fore wing glossy bluish green. Hind wing purplish blue, with a vitreous streak below cell, reaching from base to near distal edge. Under side blue. Length of fore wing 9 to 10 mm.

Hab. Entebbe, Uganda, September, 1900 (Major Rattray). Two females in the Tring Museum.

SALIUNCILLA, gen. nov.

♂. Antenna pectinated, the last four or five segments dentate. Hind tibia with one pair of spurs. In fore wing second and third subcostals, and again fourth and fifth, stalked together; the other veins from the cell; third radial from lower angle, second radial and first median close to angle, second median a short distance from first median. In hind wing all the veins from cell, subcostal distant from c, the anterior margin of cell between subcostal and the bar which connects cell with the costal vein longitudinal, slightly oblique; first radial near the subcostal, cross-vein between first and second radial deeply angulate, third radial from lower angle of cell, second radial and first median close to angle, second median distant from it.

13. *Saliuncella marshalli*, spec. nov.

Bluish black, thorax and costa of fore wing greenish; hind wing centrally sparsely scaled, semi-transparent. Wings bluish beneath at the edges, centrally paler greenish. Length of fore wing 6 mm.

Hab. Malvern, Natal, March 25th, 1897 (G. A. K. Marshall). One male in the British Museum.

MALAMBLIA, gen. nov.

♂. Antenna pectinate, gradually fining to a point, the last segments being simple, the branches short, widest at the tips. Tongue long. Hind tibia with one pair of spurs. In fore wing all veins from cell, second subcostal proximal of angle of cell, third radial from lower angle, second radial and first median close to angle, second median distant from it, but less proximal than first subcostal. In hind wing subcostal distant from c, the cell-edge between them longitudinal, slightly oblique; first radial near subcostal, cross-vein between first and second radials angulate, lower angle of cell truncate, second and third radials from angle, but separate, first median proximal of angle.

Differs from *Saliunca* in the antennal pectinations being shorter, the mid and hind tibial spurs longer, first and second subcostals of fore wing much more proximal, second median more distal, cell-edge of hind wing between costal and subcostal more longitudinal in direction and longer, not being distinctly angulate, and in the second median of hind wing being more proximal.

14. *Malamblia durbanica*, spec. nov.

Body and upper side of fore wing bluish black, without gloss; hind wing and under side of both wings blackish brown, slightly purplish. Length of fore wing $8\frac{1}{2}$ mm.

Hab. Durban, Natal. One male in the British Museum.

15. *Homophylotis leptis*, spec. nov.

♂. Body above blue, beneath brown with a purplish sheen; a long spot before apex of antenna white; eyes edged with grey, centre of frons, legs, and palpi luteous. Wings very narrow, purple-brown; hind wing with a broad vitreous stripe below cell, extending from base to near distal margin. Under side of wings brown. Length of fore wings 8 to 9 mm.

Hab. Pungo Andongo, Angola, April, 1875 (A. von Homeyer). Three males in the Tring Museum.

16. *Homophylotis catori*, spec. nov.

♂. Upper side of body and fore wing blackish green; hind wing with a very broad vitreous streak, extending from base close to distal margin, and from centre of cell to hind margin, the greenish black marginal band being widest at anal angle. A spot before the somewhat incrassate apex of antenna, the frons, palpi, sides of breast, the under side of the abdomen, except a basal central spot and the last segment, and the under side of the femora, tibiæ, and of the first tarsal segment, yellow. Length of fore wing 8 mm.

Hab. Moyamba, Sierra Leone, February, 1903 (D. Cator). One male in the Tring Museum.

POMPOSTOLINÆ, Subfam. nov.

Ocelli absent. Mid and hind tibiæ incrassate, the latter in male with scent-organ situated in a dorsal groove, which bears proximally a tuft of very long hairs. In both wings, first radial from upper angle of cell and second radial from lower angle, first subcostal and second median far distant from proximal angle, first submedian absent.

Type: *Pompostola hyparchus*, Cram. (1779).

17. *Arniocera pœcila*, spec. nov.

♂ ♀. Body dark bronze-green; dorsal edge of patagia, upper side of abdomen, except first and second segments, the palpi, a lateral spot on prosternum, and a large spot on the mid and hind tibiæ, or only on the mid tibia, red. Upper side of fore wing bluish green, with yellow markings edged with black: a subbasal band, an interrupted or mesially constricted median band, an elongate subapical spot, and a small rounded spot situated near hind angle. Hind wing uniformly green-blue. Under side greenish blue, the two distal spots of fore wing and the costal portion of the median band distinct.

Hab. Various places in Usoga, Kavirondo, Uganda, and British East Africa. A series in the Tring Museum; also in British Museum.

18. *Arniocera amœna*, spec. nov.

♂ ♀. Head, palpi, a large patch on mid and hind tibiæ, and the upper side of abdomen, except the first segment and a row of black mesial dots, pinkish red; under side of body bronze-green. Upper side of fore wing glossy pale green, with pale red black-edged markings, namely, a subbasal band, a complete or posteriorly interrupted median band, a costal subapical spot, and an elongate submarginal spot placed parallel with the distal margin. Hind wing pinkish red, distal margin and a discal band joining the same posteriorly being purplish black.

Hab. Mpwapwa, German East Africa. A series in the Tring Museum.

NETROCERA, gen. nov. (ex Felder indescri.).

♀. Palpus porrect, second segment with long fringe. Club of antenna longer and more slender than in *Arniocera*, Hopff. Spurs of hind tibia longer.

Here belong *setioides*, Feld. (1874), *tiphys*, Boisd. (1836), and the following new forms:—

19. *Netrocera setioides ugandæ*, subsp. nov.

Differs from *setioides* in the black marginal band of the fore wing being broader and very sharply defined, and in the abdomen being without any yellow scales at the sides.

Hab. Entebbe, Uganda, June, 1900 (Capt. Rattray). One male in the Tring Museum; a female from the same place in the British Museum (E. A. Minchin coll.).

20. *Netrocera tiphys basalis*, subsp. nov.

First and second abdominal segments yellow at the sides, the black distal marginal band of the fore wing not sharply defined above, its curved edge being washed out except at costal margin, the band anteriorly two or three times as broad as posteriorly.

Hab. Pungo Andongo, Angola, in February and March, 1875 (A. von Homeyer). One male and three females in the Tring Museum.

21. *Netrocera tiphys diffinis*, subsp. nov.

The first three abdominal segments yellow at the sides. The black distal marginal band with almost straight proximal edge, broad anteriorly, entering apex of cell.

Hab. Nguelo, Usambara; Monkey Bay, Nyassa, January, 1896, and Fort Johnstone, January–February, 1896 (Dr. Percy Rendall). Three males in the Tring Museum.

CALLIBAPTES, gen. nov.

♂. Palpus porrect, very long, being much longer than the fore tibia; first and third segments short, second prolonged, without fringe. Antenna much thinner than in *Netrocera* and *Arniocera*. Fore tibia much shorter than fore tarsus; spurs long; femora not fringed beneath; sc^4 and sc^5 of fore wing on a long stalk, sc^3 and r^1 branching off close to this stalk, r^2 and r^3 on a short stalk; in hind wing sc^2 and r^1 stalked, r^2 and r^3 from lower angle of cell.

22. *Callibaptés ornata*, spec. nov.

Body greenish black; first and base of second segment of palpus, the head, except a large spot on frons and another on occiput, the sides of the pronotum, the patagia and a mesial stripe on metanotum, as well as the tips of the mid and hind coxæ, yellow; third to fifth abdominal segments above bright red; under side of abdomen paler red, the last segment and a lateral line greenish black. Fore wing ochraceous yellow on upper side, with a broad green-black distal border, which is sharply incised at lower angle of cell; hind wing red, with a broad purple-blue distal border narrowing behind. Under side yellowish red from base to apex of cell, the distal area being purple-blue. Length of fore wing 15 mm.

Hab. Ogruga, Niger. One male in the Tring Museum.

MELISOMIMAS, gen. nov.

♀. Palpus very short. Tongue vestigial. Antenna pectinated from base to apex. Legs with brushes of hair-scales; hind tibia with one pair of spurs. In fore wing third to fifth subcostals stalked together, r^1 from the upper angle of cell, r^2 and r^3 from the lower; cell of hind wing short, bar connecting c with cell long, oblique, subcostal and first radial on a long stalk, cross-vein deeply angulate, hind angle of cell produced, acuminate, third radial and first median on a short stalk.

Type: *Melisa grandis*, Holl. (1893).

23. *Byblisia ochracea*, spec. nov.

♀. Palpus as long as in *latipes*, Walk. (1864). Body blackish blue, a spot on frons and under side of head white; pronotum, posterior portion of mesonotum, the metanotum, upper side of abdomen, except the last three segments, sides of breast, and the mid and hind tibiæ yellow; tibial spurs, under side of hind femur, and the centre of the proximal abdominal sternites white. Wings as in *B. latipes*, but the hyaline spots larger, especially the basal streak of the fore wing and the vitreous areas of the hind wing.

Hab. Warri, Niger, April, 1897 (Dr. F. Roth). One female in the Tring Museum.

24. *Byblisia caudata*, spec. nov.

♂ ♀. Third segment of palpus quite short; abdomen in both sexes with two long apical tufts. Body blue-black; palpus, except tip, prosternum, a spot on fore coxa, base of pronotum, apex of patagia, and four or five abdominal belts red; apex of first abdominal sternite, a spot on mid and hind tibiæ, and the spurs white. Wings purple or bronze-black, with small white semi-transparent spots, namely, a double one proximally of middle of fore wing, another at apex of cell, and a third behind first median branch, on hind wing one near base, and a second at apex of cell.

Hab. Mashonaland (H. B. Dobbie), one male in the British Museum. Lake Nyassa, one male and one female in the Hope Department of the Oxford Museum.

NOTES ON COLLECTING DURING 1906.

BY THE REV. W. G. WHITTINGHAM.

THOUGH the advantages which a parson frequently possesses as an entomologist are obvious in the freedom with which he can in many cases arrange his hours of work, a town parson generally has his hands far too full to allow of anything like systematic collecting. His expeditions are largely a matter of his settled holidays, with an occasional Monday or summer evening, and with a more constant eye to the possibilities of his own garden, if he is fortunate enough to possess one. Last year I spent ten days at the end of June and beginning of July in North Cornwall, and a good deal of the month of August in Cumberland, apparently the only part of England wherein one read the daily report of glorious weather to the frequent accompaniment of drenching rain. I give some rather desultory notes of most of my captures.

To deal first with the home insects in Leicester and neighbourhood—the mild January and February brought out the first spring Geometers very early; *Phigalia pedaria* and *Hybernia rupicaprararia* were out in January, and a series of *Lobophora polycommata*, bred from Northamptonshire larvæ, commenced to emerge on February 26th, and were all out by March 17th. Dark forms of *Hybernia marginaria* were frequent, and were several times observed, with dusky suffusion in disk, dark hind marginal area, and uniformly dusky. Then came the long spell of cold weather which produced little or nothing for weeks. A *Biston hirtaria* (female), bred by a friend, laid a batch of eggs early in April, which hatched on May 29th and 30th, and resulted in considerably over three hundred and fifty larvæ, two-thirds of which were let loose on plum trees in the garden, where they were seen feeding week after week till August. *Tephrosia crepuscularia* was plentiful during May and early June, the fuscous form apparently rather in excess of the light form. The earlier April race was not noticed, but this was perhaps due to the absence of opportunity for observation.

In May *Eupithecia abbreviata* and *Gelechia scalella* were taken at rest in Charnwood Forest; the larvæ of *Eupithecia debiliata* and *Phoxopteryx myrtillana*, and *Micropteryx aureatella* were plentiful there. A single specimen of *Eupithecia albipunctata* emerged from a pupa, the larva of which was found feeding there on *Angelica* last year.

At the end of May (30th and 31st) a visit to Northants produced *Carterocephalus palaemon* in small numbers, and *Argynnis euphrosyne* and *Nemeobius lucina* were only just appearing. *Tephrosia punctularia* and *Zonosoma punctaria* were almost the only Geometers seen.

The larvæ of *Plusia moneta* were discovered on both *Aconitum* and *Delphinium* in various parts of Leicester and the county. The insect seems to have established itself thoroughly as far north as this. On June 7th the larvæ of *Xylophasia scolopacina* were taken, still small and not numerous, though they fed up very rapidly. A morning in the Forest on June 12th produced *Venilia maculata* (few), and *Emmelesia albulata* plentifully, and the larvæ of *Nudaria mundana* were crawling about the lichen on a stone wall. During this month the trees all over the Forest district were almost completely denuded of their leaves by larvæ, mostly *Tortrix viridana* and *Hybernica defoliaria*. Possibly the late season brought on the larvæ more quickly than the leaves grew. At all events, I never remember their ravages being so marked; whole woods looked at a little distance as brown as in February. Happily they very soon succeeded in putting on a fresh growth of leaves. On June 22nd *Bomolocha fontis* was flying, and some eggs were obtained, the larvæ from which fed up and pupated at the end of August. *Hepialus velleda*, *Eupithecia debiliata*, and *Penthina sauciana* were obtained at the same time.

In the middle of July worn specimens of *Vanessa cardui* were noticed in this county, and larvæ of *Smerinthus ocellatus* were brought to me from several gardens. This is evidently a common moth in the neighbourhood of Leicester. Sugaring was almost a complete failure during the summer in this neighbourhood, a single example of *Orthosia suspecta* being the only insect obtained by this means of any interest. A female *Pericallia syringaria* was netted in the garden on July 15th; she laid a few eggs, which duly hatched, and the larvæ hybernated successfully sleeved on ash, and are now feeding on privet.

In September, *Macroglossa stellatarum* was noticed on two or three occasions in town gardens, and the following Vanessids were also seen: *atalanta*, *cardui*, *io*, and *urticæ*; but butterflies were certainly not plentiful in the late summer. The common late summer and autumn moths appeared in the garden, among them *Polia flavicincta* and *Xanthia gilvago*. The larvæ of *Hybernica defoliaria* and *aurantiaria* had been plentiful, but the emergences in the autumn were very few in proportion to the larvæ obtained, owing, perhaps, to the very dry summer. They were also late in emerging, the first *aurantiaria* appearing on November 11th, and the first *defoliaria* on November 14th. A fairly long series of *Himera pennaria* was also bred from a local female, including one male with the wings, especially the hind marginal area, suffused with rosy—a somewhat pronounced example of the coloration more usual in females.

I had an unpleasant and, fortunately, quite exceptional experience with some larvæ sleeved in the garden—*Selenia lunaria* almost full-fed, and large broods of *Acidalia aversata* and *Abraxas*

grossulariata, which I hoped to bring through the winter on the chance of getting some varieties. Some nocturnal depredators in search of apples, assuming doubtless that the sleeves were protecting some peculiarly desirable fruit, took the lot, untying the sleeves at the further end, and stripping them off, leaves and all. The marauders were, let us hope, thoroughly sold when they examined the prize they had secured, and so far that was satisfactory; but I confess, in spite of this sense of satisfaction, I regarded the stripped stems somewhat ruefully. Only on one other occasion that I can remember have my pursuits been interfered with in this way, and that was years ago, when I discovered a band of small boys in Epping Forest going round my sugar with a lantern, and picking off the moths with their fingers. As they were more or less of the London breed, to chase them round my circle (a fairly large one) was neither a very congenial nor a very successful task, and to pack up one's things and go seemed the more discreet part to take.

(To be continued.)

COLLECTING LEPIDOPTERA IN THE LAKE DISTRICT IN 1902, 1903, AND IN 1905, 1906.

By A. H. FOSTER.

BEING much interested in reading in the 'Entomologist' the experiences of Messrs. P. J. Barraud and A. E. Gibbs while collecting in Cumberland (Entom. xl. p. 67, *et seq.*), I think perhaps the following notes of my own experiences of the Lepidoptera of that district may be of interest for comparison.

In 1902 I went to Westmorland in the middle of July for a fortnight's collecting, the object being to study the butterflies and moths in general, and to search for *Erebia epiphron* in particular.

Langdale Pikes seemed from all accounts to offer a likely field for investigation, and accordingly I put up at a wayside inn at Little Langdale village. I was accompanied by a friend who, though not himself a collector, was very keen to help me by catching everything he could.

The weather was almost perfect the whole of our stay, and our attention was quickly turned to hunting for *E. epiphron*. We searched the sides and tops of the following mountains—Wetherlam, Great How, Conistoun Old Man, Pike of Blisco, Fairfield, and Dollywaggon Pike, but without seeing the faintest trace of *epiphron*. Our next attention was turned to Langdale Pikes, where, after getting quite to the top and going down a little on the other (north) side, we found *epiphron* in the greatest pro-

fusion. The butterflies were found over an area extending from the top of the mountain, at the back of Harrison Stickle (the highest "pike"), northwards to the top of High White Stones, and westwards to the left as far as the track leading into Langstrath, known as Stake Pass. This area is a wide, dreary expanse of coarse grass, rushes, and bog, which slopes gently towards the head of Borrowdale. The whole of this area is above 2000 ft. high, and is exposed to the full force of the north and north-west gales and storms, and these storms are some of the worst it is possible to encounter. It is a remarkable fact that on the south side of Langdale Pikes, about three-quarters way up the mountain, there is an extensive grassy plateau, beautifully warm, and sheltered from all the strongest winds and rain; but, in spite of this, I have never found *epiphron* on this place, with the exception of one specimen, which, oddly enough, we took on the first day we ascended the mountain. This was the first specimen of this butterfly I ever saw alive, and was the only one taken on that day (because on that day we did not go high enough up to find others). I have been over this plateau at least twenty or thirty times since, but have never seen *epiphron* on it again.

This butterfly is a most interesting insect; it never flies while the sun is not out, but however strong the wind or wet the grass, directly there is a gleam of sun, the butterflies appear in scores, and the whole place seems alive with little black dots moving about; directly the sun goes in, the "black dots" go in too, disappearing as if by magic; and so thoroughly do they "go in" that it seems practically impossible to find a single specimen in the grass, however diligent the search.

We also found *E. epiphron* fairly abundantly on and near the top of Red Screes, overlooking the Kirkstone Pass; and in 1903 I found it on the side (north-west) of Helvellyn, and on the top of Honister Crag, and on the top of Brandreth; in fact, on the tops of all the mountains which form the head of Ennerdale and Buttermere Valleys, viz. Fleetwith Pike (= Honister), Grey Knotts, Brandreth, Kirk Fell, and the back of Green Gable; but I could never find it on Great Gable nor, with the exception of one specimen, anywhere round Styhead Tarn, nor between there and Esk Hause or Rossett Ghyll. I mention these places in detail because many of them are mentioned in Newman as localities for *epiphron* (Great Gable, Honister, Styhead Pass and Tarn, Langdale Pikes, and Red Screes). I do not know the experiences of other collectors as to localities for this species, and should very much like to hear some to compare with my own. I have very rarely found it at a less elevation than 2000 ft., and I cannot call to mind ever taking it on the south side of any mountain; the sides and tops of all those mountains above mentioned on which it was taken are all exposed to the

north and north-west. I should particularly like to know if anyone has taken *epiphron* on any of the following mountains : Pillar, Steeple, The Sail Hills, High Stile, Red Pike (Buttermere), Dale Head, Hindscarth, Robinson, Grassmoor, Skiddaw, Saddleback, or the Armboth Fells, or on any of the fells beyond Helvellyn which end in Great Dod.

In looking for other insects besides that just referred to, Lingmoor Fell offered the most likely ground for search. This is the fell which divides Little and Great Langdale Valleys, and is almost entirely covered with heather. It is about 1400 ft. high at its highest point, and is the only heather-covered hill anywhere in the neighbourhood. Almost the first insect captured on first ascending to the "heather-region" was *Plusia interrogationis*. We did not investigate this fell until we had been there a week, and as we had taken enough *E. epiphron*, we turned our attention for almost the whole of the remaining week to hunting *P. interrogationis* and other insects over the heather. And truly it was a hunt: a blazing hot sun, heather run wild on stalks as thick as one's arm and growing four or five feet high, hiding rocks over which one stumbled at every other step; add to these difficulties the picture of two very energetic and very excited collectors running at full speed after little spots which seemed to flash about like lightning, and one has a true picture of those hunts after *interrogationis*. However, after many tumbles over rocks and into bogs and much scraping of shins, we managed to secure forty-eight specimens of the *Plusia* during the week. Next year (1903) we went a week earlier on purpose to try and get as many *P. interrogationis* as possible, but we never saw a single specimen, nor yet have I seen it in the two subsequent seasons in which I went there. In 1903 we met with quite a different lot of insects to those in the previous year, and were particularly engaged in chasing *Lasiocampa* (*Bombyx*) var. *callunæ*, the males of which were dashing about all over the heather; but they were very difficult to catch, because of the difficulties above enumerated. I turned my attention to finding a female, but could not do so until two days before we left, when, oddly enough, I found two on the same afternoon. Up to this time our total captures of *L. callunæ* were something under a dozen, all males, but we succeeded in taking over fifty more in the two remaining days. It was only necessary to put a female on the front of one's coat and then go and hunt for something else. If a male *callunæ* happened to dash by anywhere near, it would be certain to pull up short, and, after hovering round for a while, would settle on one's coat, and be easily picked off. For the last week in 1902, and the whole fortnight in 1903, we were residing at Blea Tarn House, a farm on the edge of Blea Tarn, at the foot of Pike of Blisco on one side, and Lingmoor Fell on the other. From here we could

work Langdale Pikes and other mountains for *E. epiphron*, and Lingmoor was of very easy access for collecting over the heather.

(To be continued).

NOTES ON THE INCREASE IN NUMBERS OF LEPIDOPTERA-RHOPALOCERA IN MAURITIUS.

BY CAPTAIN B. TULLOCH, F.E.S.

IN England one has to deplore the fact that not only are local species of butterflies becoming still more local, and in some cases almost extinct, but also that many of the commoner species are gradually becoming scarce. This, of course, is due to many causes—as, for instance, the disappearance of forest lands, the drainage of fens, the trimming of hedges, and also to the insatiable desire of many “collectors” to obtain a long series of the same species. This desire for a series always seems to me to be one of the chief reasons why so many species of butterflies and moths are rapidly disappearing in Britain. In Mauritius, however, the very opposite is occurring, for not only are new species arriving by some means in the island, but even those species which do find a footing increase rapidly in numbers. Why this increase in numbers of a particular species should occur I will endeavour to show later on.

In 1833 Boisduval enumerated twenty species of butterflies as inhabiting Mauritius, or, including one doubtful species, twenty-one in all. Roland Trimen visited the island in 1865, and discovered twenty-six species. I myself arrived at the island in March, 1899, and soon found three other species, all common, not noticed by Trimen, viz. *Papilio demoleus*, *Zizera knysna*, and *Z. gaika*.

I have just received a letter from Lieut.-Colonel N. Manders, R.A.M.C., who asks me whether I found *Cocynis ligneus*, *Zizera maha*, and a species of *Lycæna* not previously mentioned. He stated that these three were all common in parts of the island. As I worked Mauritius pretty thoroughly whilst I was in the island, and did not find the three species mentioned, I conclude that they are also of recent introduction. But the most extraordinary thing is the rapidity with which a species multiplies once it has been introduced into the island. *Papilio demoleus* did not exist in Mauritius in 1865, yet whilst I was there it was to be found everywhere.

In the library at Port Louis I found a French natural history of Mauritius, in which mention is made of a white butterfly having been seen in the island, and the author, writing somewhere about the beginning of the nineteenth century, wonders

what kind of *Callidryas* it was. This was probably *Catopsilia florella*, stated by Trimen not to be common, but now swarming everywhere. Again, Trimen saw only one specimen of *Danaïs chrysippus*. This species is also now common everywhere.

Of other species mentioned by Trimen, *Atella phalanta* is so numerous in certain places that I have caught two at a time in my net. *Pyrameis cardui* was not seen, but is now common. *Neptis frobenia* has increased in numbers, and so also must *Hypolimnas misippus*, since Trimen only saw one specimen of this butterfly. He also only found *L. bætica* and *L. telicanus*, and what he thought was *L. lysimon*. I found *L. bætica*, *L. telicanus*, *Z. gaika*, and *Z. knysna* all common almost everywhere. So we find that in 1833 there were 21 species of butterflies observed in the island; in 1865, 26 species; in 1899, 28 or 29 species; in 1907, 32 species at least are reported. How the butterflies arrive in Mauritius is a matter of conjecture. The nearest large expanse of land is Madagascar, 550 miles distant. Once, however, a species reaches the island various causes allow it to remain and multiply. One is the absence of "collectors" to harry and decimate it. The extraordinary variety and luxuriance of the vegetation of the island permit the incoming insect to either at once find its natural food-plant or some allied one, which will do just as well.

At Port Louis I found the larvæ of *Daphnis nerii* feeding on oleanders, and took them up to Curepipe, 1600 feet above sea-level, where no oleanders grow. The curator of the Curepipe Botanical Gardens, however, showed me an allied tree growing in the jungle, and on this the *nerii* larvæ fed up readily. I subsequently found these larvæ on half a dozen different kinds of shrubs. The larvæ of *Acherontia atropos* feeds on at least a dozen different kinds of trees and plants all over the island; consequently it swarms in the island. Then, again, climatic conditions, and the varying temperature between Port Louis at sea-level and Curepipe at 1600 feet, allow a continuous succession of broods to be produced. I have often found eggs, larvæ of different sizes, pupæ, and imagines of *Papilio phorbanta* on the same day.

Yet another reason for the increase seems to be the want of ichneumon-flies and other parasites. I bred nearly all the Mauritius butterflies from larvæ, and also dozens of hawk-moths, including *D. nerii* and *A. atropos*, and I do not remember to have had a single caterpillar or pupa infested with ichneumons.

Against these reasons for increase, however, should be placed the enormous damage that must be done to insect life by the violent cyclones that annually visit the island with more or less intensity. In December, 1900, whilst I was in the island, a very violent cyclone that lasted for three days arrived. So violent was the wind that all the leaves were torn off the trees, so that

what had a short time before looked like an impenetrable jungle was, after the cyclone had passed, as bare of leaves as an English wood in mid-winter. There is also very heavy rain, as a rule, with these cyclones, and innumerable quantities of eggs, larvæ, and perfect insects must be destroyed by the wind and floods. Yet a month after the cyclone mentioned the vegetation had recovered itself, and there seemed to be as many butterflies as ever. Do butterflies know when a cyclone is coming, and take extra precautions to hide in safe spots?

Moor Lane, Strensall, York.

NEW AMERICAN BEES.—III.

By T. D. A. COCKERELL.

Triepeolus banksi, sp. nov.

♂. Length about $9\frac{1}{2}$ mm., anterior wing $7\frac{1}{4}$; black, with the pubescence pale cinereous (not yellowish); head and thorax extremely densely punctured; labrum, antennæ, and mandibles entirely black; maxillary palpi three-jointed, but the basal joint small and easily overlooked; face covered with appressed silvery-white hair; thorax short and very high; scutellum dull and coarsely rugose, feebly or quite strongly bilobed; the lateral teeth black, fairly large and stout, but not surpassing scutellum; pleura hairy, the lower part more nude, densely punctured, with a shining spot posteriorly; markings of thorax above much as usual, but instead of a pair of lines on the mesothorax anteriorly, there are two large suffused flame-like areas of pale hair, more or less confluent with the pale hair of the lateral corners; tegulæ dark reddish; wings rather dusky, quite strongly so on apical margin; legs black, the tarsi, especially the small joints, becoming pale reddish; spurs brown or reddish; abdominal bands greyish white; first segment with the black area a broad transverse band, squared off at the sides; the apical bands on segments one to three, and the others sometimes, interrupted in the middle, the bands on two and three somewhat club-shaped on each side; the band on two has a squarish anterior projection at the sides, which forms with the band a right angle or somewhat less; second and third ventral segments with a broad apical band of white hair; second segment also with the middle covered with white hair (except sometimes a central spot), but the sides (separated from the light by a straight line, and constituting about one-fourth on either side) dark; outstanding fringe of fourth and fifth ventral segments mainly black. Runs in tables of *Triepeolus* to *T. donatus*, Smith, of which it looks like a small form. It is, however, clearly distinct; the basal band of the first abdominal segment is perfectly entire (divided in *donatus*), the thorax beneath is densely white-haired (black and nude in *donatus*), the ornamentation of the mesothorax is different (*donatus* having distinct stripes), and the eyes are dark coffee-brown (light green in *donatus*).

Hab. Falls Church, Virginia, August 26th and September 7th (Nathan Banks). *T. donatus* I have from Ames, Iowa.

From the descriptions this may seem somewhat like *T. wyomingensis*, Ckll., but that has the pattern of the first abdominal segment entirely different; and the colour of the light bands of *banksi*, when placed beside *wyomingensis*, appears quite different—a sort of pale bluish by contrast.

Epeolus semilectus, sp. nov.

♂. Length about 9 mm.; black, shining; vertex, mesothorax, scutellum, and pleura with very large irregularly-placed punctures on a shining surface, the punctures dense in places, in others sparse; face with silver-white hair; labrum black, mandibles red in middle; second antennal joint red beneath, and scape red at extreme base; light markings white, not noticeably yellowish (but not bluish); mesothorax with two rather inconspicuous stripes; middle of ventral surface of abdomen densely covered with white hair; scutellum strongly bilobed, the axillar teeth sharp, but not surpassing it; tegulæ apricot-colour; wings with the basal half hyaline, the apical half strongly rufo-fuscous; legs red, but the trochanters, and the hind femora and tibiæ, mainly black, the hind knees broadly red, however; spurs on hind legs brown, on middle ferruginous; abdomen shining, with the punctures small and feeble; the light bands on apices of segments very narrow, that on the first broadly interrupted; transverse black area on first segment as broad as possible, ending obtusely and rather suffusedly very near lateral margins; extreme hind margins of segments, especially the apical ones, brownish; basal part of apical segments brownish; apical plate broad; ventral segments two and three with narrow white hair-bands. Close to *E. lectus*, Cresson, but abdomen not strongly punctured, half of wings darkened, and band on apex of first abdominal segment broadly interrupted. Still closer to *E. lectoides*, Robertson, but only one band interrupted. It may perhaps be a geographical race of *lectoides*, which is known at present from Illinois.

Hab. Falls Church, Virginia, July 4th (Nathan Banks).

Epeolus vernoniæ, sp. nov.

♂. Length $7\frac{1}{2}$ mm. or a little less; vertex, mesothorax, scutellum, and pleura coarsely rugose; colour black, including scutellum, but *tubercles and axillar teeth bright ferruginous red*; clypeus very minutely and densely punctured; face with much silvery hair, slightly stained with yellowish about base of antennæ; labrum black, with two little ridges on its lower half in the middle; mandibles ferruginous, simple; antennæ brown-black; pubescence of thorax and abdomen above, forming the light markings, pale ochreous; mesothorax with two lines, not very conspicuous; scutellum emarginate in middle; axillar teeth large, conspicuously surpassing scutellum; pleura crossed by a rather indefinite band of light hair; *tegulæ bright apricot-colour*; wings dusky hyaline, the apical margin broadly much darker; stigma amber-colour, nervures fuscous; legs red; middle femora with a blackish shade beneath, hind femora mainly black beneath and behind; *spurs black*; abdomen broad and convex, with fairly broad *entire bands on all*

the segments; black area on first segment a very broad band, almost dividing the light laterally; extreme hind margins of the apical segments light brownish; apical plate broad, its apical half red; hind margins of ventral segments broadly pale brown, those of the second and third with a thin covering of white hair. In Robertson's table in 'Canadian Entomologist,' October, 1903, this runs nearest to *E. pusillus*, but differs in the scutellum, which does not nearly equal the lateral teeth, and in the partly black legs. According to Brues, *pusillus* has the teeth at the sides of the scutellum red, as in *vernonia*; but Cresson makes no mention of this, and it seems unlikely that he would overlook such a conspicuous character. Cresson also describes the abdominal bands of *pusillus* as cinereous, whereas in *vernonia* they are very strongly yellow. The antennæ of *pusillus* are said to be red basally; in *vernonia* they are black, only the extreme base of the scape showing a little reddish. With all this, *vernonia* may be a race of *pusillus*, but in the absence of any proof I leave it as distinct.

Hab. Falls Church, Virginia, September 4th, at ironweed (Nathan Banks).

Epeolus virginianensis, sp. nov.

♂. Length 9 mm. or a little less. A small species similar to *vernonia*, but differing as follows: Eyes light green (light reddish in *vernonia*); mandibles darker, the basal half black, the apical dark reddish; thorax smaller; stripes of mesothorax connecting with bands which run along the anterior margin and curve back to the tegulæ (no such bands in *vernonia*); tubercles and axillar spines black, the latter very much smaller, not nearly reaching the level of end of scutellum; pleura thinly overspread with hair, except just below the wings; tegulæ piceous, a little reddish behind; wings dusky, the apical margin not contrasting, stigma rufo-fuscous; all the femora black, except the knees; anterior tibiæ black, except at ends; middle and hind tibiæ red, the latter with a dusky shade in front; abdomen somewhat narrower, the bands perhaps not quite so yellow; band on apex of first segment interrupted, and that on apex of second with a linear interruption; apical plate only about half as broad. The mandibles are simple, and the spurs are black.

Hab. Falls Church, Virginia, September 7th (Nathan Banks).

At Glencarlyn, Virginia, September 6th, Mr. Banks took *E. autumnalis*, Rob.; new to Virginia.

Panurginus virginicus, sp. nov.

♂. Length about 5 mm.; black, with the general stature and appearance of *P. pauper* (Cresson), but easily distinguished by the lemon-yellow face markings, and especially by the large quadrate head, with the face very wide. Clypeus, lateral face-marks, labrum, mandibles (except the ferruginous tips), all yellow; but no supra-clypeal mark. Lateral marks pyriform, not extending above level of clypeus, the point directed toward the malar region; clypeus well punctured all over; flagellum long, testaceous beneath except at apex and extreme base; mesothorax nude, very minutely and closely punctured, the median groove strong; tubercles and tegulæ testaceous;

wings smoky, especially the apical half, very strongly iridescent; nervures dark fuscous; second r. n. meeting second t. c.; first r. n. joining second s. m. not quite one-fourth from base; legs black, with anterior tibiæ in front, all the knees, apices of middle and hind tibiæ, and all the tarsi, pale ferruginous; abdomen shining, the punctures exceedingly minute.

Hab. Falls Church, Virginia, June 4th (Nathan Banks).

Mr. Banks has also taken *P. pauper* (Cresson) and *P. illinoisensis* (Cresson) at Falls Church in June.

University of Colorado, Boulder, Colorado:
March 19th, 1907.

NOTES AND OBSERVATIONS.

ACRONYCTA TRIDENS AND PSI.—With regard to the note on page 119 on the differentiation of these insects, is it not the fact that the females can be distinguished by the colour of the hind wings, which in *tridens* are grey, and in *psi* white? It is so at least in my series, all of which are bred; but if I am wrong in this, I shall be glad to be corrected.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford.

CAPTURES AND FIELD REPORTS.

HALESUS RADIATUS.—Mr. A. Sich was kind enough to give me a specimen of this caddis-fly, taken at Chiswick on October 4th, 1903. The record is of interest on account of the encroachment of bricks and mortar over the neighbourhood.—W. J. LUCAS; 28, Knights Park, Kingston-on-Thames, May 13th, 1907.

VANESSA CARDUI.—On May 11th numbers were seen at Oxshott. They were flying strongly, and usually more or less with the wind, from a south-westerly direction. None were seen to settle, nor could a capture be made. They gave one the impression that they formed part of a migration.—W. J. LUCAS; 28, Knights Park, Kingston-on-Thames, May 13th, 1907.

CYANIRIS ARGIOLUS IN NORTH-WEST LONDON.—I should like to record the fact that I saw a specimen of *C. argiolus*, L., in the garden here, to-day. It was flying in the bright sunshine, and appeared in fine condition, probably having just emerged. It has been observed here in May and July most years since 1899, and seems to have become firmly established. It is the only "blue" we ever see here.—HAMILTON H. DRUCE; The Beeches, Circus Road, St. John's Wood, London, N.W., May 11th, 1907.

SCARCITY OF LARVÆ IN SEASON 1907.—I notice in the reports of the City of London Entomological Society in the May 'Entomologist' that Mr. L. W. Newman comments on the scarcity of the larvæ of

Arctia caia this season. I can quite confirm his report, at all events as regards this neighbourhood. For several seasons past I have reared considerable numbers of *Odonestis potatoria*, *Lasiocampa quercus*, *Arctia villica*, and *A. caia*, with a view of obtaining varieties. I may mention that I have been fairly successful in this respect, this being specially the case with *A. caia* and *O. potatoria*. I would also point out that it has been my invariable custom to turn loose all type-specimens in the haunts where I find the larvæ, so that the scarcity of both, last season and this, cannot be put down to over-collecting as far as I am concerned. For instance, last season, rearing over one hundred *A. caia*, I only set eleven, all the rest being turned loose. Probably the numbers of these four lots of larvæ obtained, and a few comments, may be of interest. *Odonestis potatoria*.—In 1902 I took one hundred and twenty-three larvæ; in 1903, one hundred and seventy-one; in 1904, sixty-three; in 1905, sixty-seven; in 1906, nineteen; and this year, to date, only three. *Arctia villica*.—In 1902, forty-nine larvæ; in 1903, one hundred and six; in 1904, twenty-five; in 1905, fifty-one; in 1906, none; and this season, twelve. Last season these larvæ seemed quite extinct, yet they could not have been, as my son took six imagines. This year it seems to be appearing again, as we have taken twelve, as mentioned above, all of which have fed up well and have now pupated. *Lasiocampa quercus*.—In 1902, one hundred and sixty larvæ; in 1903, one hundred and six; in 1904, seventeen; in 1905, ten; in 1906, one; and this year, to date, one. This species was very abundant in the seasons 1902–3, but, though feeding up well and spinning up apparently healthily, very few of the larvæ pupated, but died in the cocoons. One or two correspondents, to whom I sent a few larvæ, confirmed my observations in this respect. Since 1903 *L. quercus* has been very scarce around here. *Arctia caia*.—In 1902, ninety-five larvæ; in 1903, two hundred and ninety-eight; in 1904, three hundred and seventy-four; in 1905, five hundred and thirty-one; in 1906, one hundred and seventeen; and this year sixty-four. In 1902 I bred some very nice varieties, nearly all dark; and in 1903, four specimens with lemon-yellow under wings, and another with a broad white line right across the thorax. Since then there has been nothing very special. The larvæ this season are all doing well and look healthy. To turn to another matter—my son took a nice specimen of *Smerinthus ocellatus* on a lamp to-day; is not this rather early for this insect?—H. HUGGINS; 13, Clarence Place, Gravesend, May 16th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 1st, 1907.*—Mr. C. O. Waterhouse, President, in the chair.—M. Alexandre Bonnet, of 36bis, Boulevard Bineau, Neuilly-sur-Seine, Seine, France; Mr. Henry Murray Giles, of Perth, Western Australia; Mr. Arthur Leslie Raywood, of Colebrooke, Park Lane, Wallington, Surrey; and Mr. Yeend Duer, of Tokyo, Japan, were elected Fellows of the Society.—The decease was announced of the Rev. William Henry Heale, M.A.—

Mr. O. E. Janson exhibited a small collection of Coleoptera, made by him in Iceland in July, 1906, comprising thirty-nine species, of which some were previously unrecorded as inhabiting that island. He also drew attention to the affinity between the beetle fauna of Iceland and of Scotland, only one of those taken, *Colymbetes grœnlandicus*, Aubé, not occurring in both countries.—Mr. J. A. Clark brought for exhibition living larvæ of *Otiorrhynchus sulcatus* feeding on the roots of ferns.—Commander J. J. Walker showed living specimens of *Oxythyrea stictica*, L., *Epicometis hirtella*, L., and *Anthaxia parallela*, taken by Dr. T. A. Chapman at St. Maxime, Var, S. France.—Dr. F. A. Dixey exhibited specimens of seven different forms of the variable female of *Leuceronia argia*, Fabr., showing that each form stood in mimetic relation with a separate model.—The President, some Coleoptera collected in Pahang by Mr. H. C. Robinson and recently received at the Museum. The series contained some interesting cases of mimicry between beetles of widely separated groups.—Dr. G. B. Longstaff, living specimens of the Elaterid *Pyrophorus noctilucus*, Linn., brought from Trinidad by Dr. F. L. J. M. de Verteuil, R.N.—Mr. H. St. J. Donisthorpe, on behalf of Prof. T. Hudson Beare and himself, specimens of *Quedius riparius*, Kell., and *Trypodendron quercus*, Eich., taken by them at Porlock, Somersetshire, on April 16th and 17th; also *Hydrovatus clypealis*, Shp., taken on April 14th at Worle, near Weston-super-Mare.—Mr. Donisthorpe also showed the larva and pupa of a Dipteron of the genus *Microdon*, taken in a nest of *Formica fusca* at Porlock last month. A number of larvæ were taken, and one of the nests in which they occurred.—Mr. R. Shelford exhibited a specimen of the curious Orthopterous insect *Hemimerus taipoides*, Walk., from Portuguese Guinea, and read a note on "A Case of Homœotic Variation in a Cockroach."—H. ROWLAND-BROWN, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 28th.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Main exhibited specimens of the mole flea *Hystricopsylla talpæ*. On behalf of Mr. Alderson, specimens of *Musca domestica*, bred from maggots expelled from the intestines of a child. This was said to be the first time that the species had been properly identified, although similar occurrences had been previously reported.—Mr. Adkin, several series of *Anchocelis rufina* from various localities, those from Rannoch being the most richly coloured.—Mr. Montgomery reported *Pieris napi* as flying in mid-March.—Mr. Newman, *P. napi*, *P. rapæ*, and *Vanessa atalanta*, as being common in South Devonshire.

April 11th.—The President in the chair.—Mr. Lucas exhibited the rare Entomostrican, *Chirocephalus diaphanus*, found in water in cart-ruts at Claygate.—Mr. South, preserved larvæ at different instars of *Gastropacha quercifolia* and *Epicnaptera iicifolia*, and discussed the orange markings present on the second and third segments; also a cocoon of the latter species and of *Lalia canosa*.—Mr. Tonge, photographs of the cocoons of *Dicranura bicuspis* among lichen and of a larva of *Charaxes jasius*, showing the peculiar conformation of the head.—Mr. West, the rare Coleopteron, *Oxygæmus variolosus*, from Darenth Wood, in August, 1903. The species is rare on the Continent.—Mr. Newman, a long bred series of *Polygonia c-album*, repre-

sentative of some seven hundred, showing but trivial variation.—Mr. B. Adkin, a bandless form of *Anaitis plagiata*, a *Eupithecia pumilata* with only two transverse lines, with nice forms of *Camptogramma bilineata*, and other species.—Mr. Kaye, a bred series of *Daphnis nerii* from Dalmatia.—Mr. Adkin, a series of *Cymatophora duplaris* from Rannoch, and contributed notes on the two very distinct forms. Mr. Adkin made some remarks upon insects attacked by verdigris, and a discussion ensued, Messrs. Montgomery, Kaye, South, and others taking part.—Mr. Turner, the butterfly-like moth *Synemon parthenoides*, the sexually very dimorphic *Heteronympha merope*, and other insects from West Australia.—Mr. Rayward read notes on the curious relations he had observed between ants (*Formica flava*) and the larvæ of *Polyommatus icarus*, and gave details of his experiments.

April 25th.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Newman exhibited a branch of birch, upon the twigs of which were about a thousand ova of *Dimorpha versicolor*, laid by females sleeved around it.—Mr. Main, some small scorpions, the larva of a Mantis, and an example of the large *Acridium ægypticum*, all living, and sent him from Hyères by Dr. Chapman.—Mr. Sich, the ova of *Lithocolletis concomitella*, a species closely allied to the more common *L. pomifoliella*.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — This, the concluding meeting of the session, was held at the Royal Institution, Colquitt Street, Liverpool, on April 15th, 1907.—Mr. W. Mansbridge, F.E.S., Vice-President, in the chair.—Mr. Robert Newstead, F.L.S., F.E.S., lecturer on economic entomology and parasitology at the Liverpool University, delivered a lecture upon the Tse-tse flies (*Stomoxys*) and the Glossinæ, the latter being the insects which produce sleeping sickness. The lecturer described the life-history and development of these most interesting flies, giving particulars of their habits and distribution, as well as the structural characters available for classification. The life-history of *Stomoxys* remained unknown until worked out by the lecturer, partly upon captive specimens, verified by his discovery at Rossett, last year, of the fly in every stage. The flies were found laying their eggs upon heating grass mowings, and feeding upon the warm decomposing grass were embryos in all stages of development. The mouth parts, which form the biting organ, were very fully described by Mr. Newstead, and illustrated by blackboard drawings and microscopic preparations of these—in many respects—remarkable flies. Specimens of eight out of nine known species of the Glossinæ were exhibited by the lecturer, together with preserved larvæ and pupæ, which had not previously been seen in public, the whole showing in a remarkable way Mr. Newstead's great powers of observation and patience in working out the minute details of these previously little known life-histories.—Mr. Joseph Collins, of Oxford, sent for exhibition a box of Coleoptera and Diptera taken from moles' nests in the vicinity of Oxford, and contributed notes. Working on lines suggested by the researches of Dr. Joy, of Reading, Mr. Collins found the following species, all of which were shown, viz., *Quedius vexans*, common; *Q. longicornis*, a short series, much rarer than *vexans*; *Aleochara spadicea*, fairly common; *A. succicola*, *Heterothops nigra*,

common; *Oxyptoda spectabilis*, not common; *O. metatarsalis*, in two localities, a nice series; *Homalota paradoxa*; *Oxytelus fairmairii*; *O. sculpturatus*; *Medon castaneus*; *M. propinqua*. Diptera: *Hystrihopysylla talpæ*, the mole flea.—Mr. W. A. Tyerman exhibited a long bred series of *Tæniocampa gothica*, which had fed on lilac; and preserved larvæ of *Odontopora bidentata*, showing protective resemblance to the lichen commonly found on birch-bark.—Mr. Oscar Whittaker living examples of *Plea minutissima*.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—April 15th, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. E. C. Rossiter showed *Tæniocampæ*, bred from dug pupæ from Wyre Forest; amongst them were specimens of *T. incerta* which approached *T. stabilis* so nearly that he was uncertain to which species to assign them.—Mr. Hubert Langley, various Lepidoptera from the neighbourhood of Leamington, including *Sarrothripus revayana*, Sc., taken on sallow bloom and new to Warwickshire, and dark forms of *Hybernina marginaria*, Bork., female, *H. leucophæaria*, Schiff, and *Chimabache jagella*, F.—Mr. J. T. Fountain, a large number of Lepidoptera taken already this year, including live *Biston strataria*, Hufn., taken that day at Sutton, *Panolis griseovariegata*, fine specimens from Sutton, *Vanessa polychloros* and *Polygonia c-album* from Wye Valley, &c. He remarked on the extraordinary resemblance of the *Panolis* to bits of fir cone with which the ground was plentifully bestrewn by birds or squirrels, and amongst which they were taken.—Mr. L. Doncaster, the specimens of *Angerona prunaria*, L., reared by him in the course of his breeding experiments upon the species, the results of which he explained.—Mr. G. T. Bethune-Baker, a series of the magnificent butterflies belonging to the Morphinæ, genus *Tenaris*, from New Guinea.—Mr. C. J. Wainwright, Lepidoptera taken by Mr. W. H. Hardaleer, including *Noctua castanea (neglecta)* from Sutton, *Hadena trifolii (chenopodii)* from Handsworth, &c.—Mr. G. H. Kenrick remarked that the *castanea* were neither of the Southern grey form nor the Northern reddish form, but of an intermediate brownish colour, and that he had taken similar specimens at Wyre Forest.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

A Natural History of the British Alucitides: a Text-Book for Students and Collectors. By J. W. TUTT, F.E.S. Vol. i. [vol. v. Nat. Hist. Brit. Lep.], pp. i.-xiii, 1-558. London: Elliot Stock. Berlin: Friedländer & Sohn. 1906.

To anyone who has hitherto regarded the "Plumes" as a number of closely-allied species, differing principally among themselves in colour and markings, vol. v. of Mr. Tutt's 'British Lepidoptera' will come as nothing less than a revolution with all its horrors. To the earnest student, however, who, though unacquainted with all the minutiae of the structure and of the life-histories of the different species, has yet become cognisant of the really wide separation which

exists between many species which authors have hitherto lumped together in the same genus, this book will be a revelation and a delight.

The author divides the Plumes or Alucitids into two superfamilies, the Agdistides and the Alucitides, the former containing—as far as Britain is concerned—only one species, *Adactylus bennetii*, while the latter includes all our other Plumes (except *Orneodes*, which is not an Alucitid at all). The Alucitides are again divided into two families, the Platyptiliidæ and the Alucitidæ. This division is a very natural one, and the characters marking these two families are apparent in the ovum, larva, pupa, and imago.

It is true the present volume only deals with the Agdistides and the first family of the Alucitides, some twenty species; but if we have such a detailed account of these species in volume v., we may hope for an equally good account of the remainder subsequently. As the author rightly points out, Zeller and O. Hofmann are the authorities on which the student of the Palæarctic Alucitids places most reliance. The former seems to have had an unerring inspiration in discovering and defining the different species, while the latter possessed a marvellous talent of grouping the species by their affinity. Authors, in fact, except Hübner, Zeller, and Wallengren, up till the time of the publication of Hofmann's 'Die deutschen Pterophinen,' appear to have treated the Alucitids somewhat like bits of glass in a kaleidoscope, and each one shook them up till they formed a pattern to his own liking; some continued the process even after 1895, ignoring Hofmann's splendid work.

In the present volume the classification of the Alucitids has been carried very much farther, and all the known facts employed in this process are placed at the student's service. The affinities and differences displayed by the ovum, larva (in all its instars), the pupa, and the imago, as well as the divergency shown in the life-history and habits of each species, are all taken into account. This has unfortunately necessitated the creation of several new genera, a fresh burden on the entomologist's memory. The origin of the Alucitids is well discussed in all its bearings, but as yet no sufficiently clear light has been thrown on this problem, and it seems to be a question as to whether the connecting links between the more generalized ancestors of the Alucitids and the species now existing on the Earth have not, one and all, been entirely swept away. Perhaps when the Micro-Lepidoptera of the Tropics, and especially of Australasia and other more or less untouched regions, have been thoroughly worked out, we may become acquainted with forms of Alucitids, more generalized than we now know, which will throw a clearer light on the origin of the group. Though this volume deals especially with British species, it treats of them on such broad lines that incidentally it contains a good deal of information on palæarctic species which have not yet been discovered in the British Isles. This feature is particularly noticeable in the account of the Agdistides, of the Stenoptiliinæ, and Oxyptilinæ. The account of the general biological characters of the Alucitids, occupying twenty-five pages, and containing a most useful tabulation of the chief larval characters of most of the larvæ, is

excellent, especially where it deals with the larva and pupa. No mention, however, appears to have been made, in dealing with the imago, of the peculiar, usually dark, club-shaped scales which lie on the under side of the second plumule of the hind wings, mostly near the base; this feature is observable on the under side of the hind wing of the Agdistides as well as in the Alucitides.

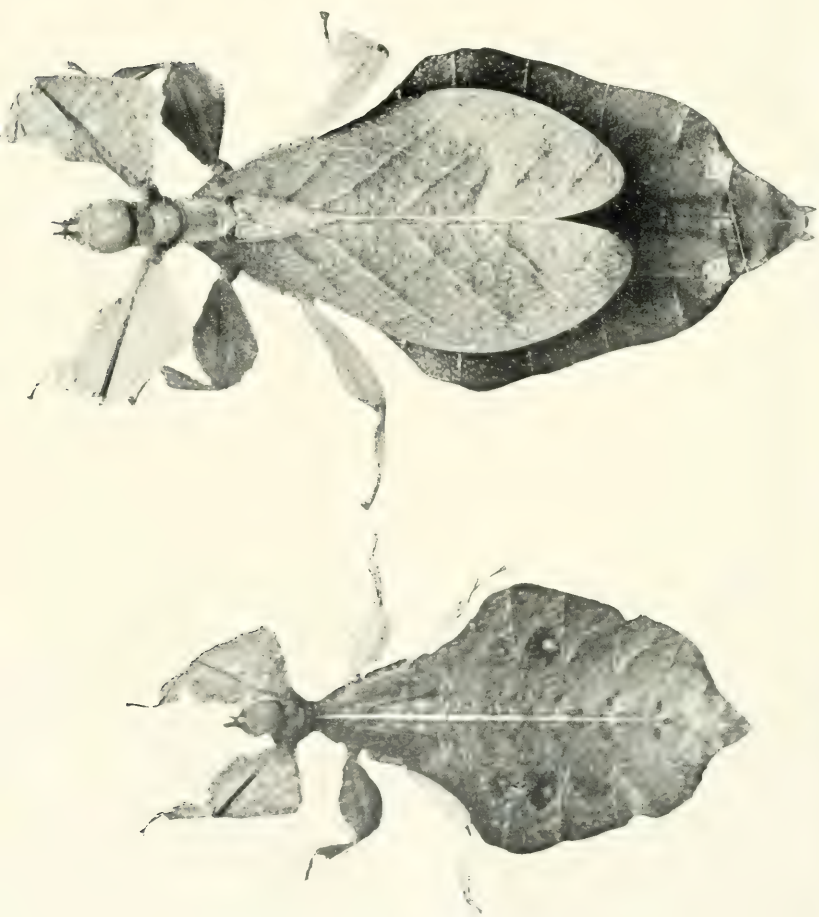
When the accounts of each separate species come to be considered, it must be said that the minute details which are here found recorded show the patient and persistent work which has been so successfully carried out by the author and his collaborators. Firstly we have references to the works of authors who have previously written on the species, then the original description of the imago, which is followed by a description of the species in all its stages, its life-history, times of appearance, and the localities where it occurs. The larval and pupal descriptions are not confined to the colours and markings, as so many, practically useless, descriptions are, but are carried out in such a manner as to ensure all outward structural peculiarities being noted, the form and position of the tubercles, their setæ, the presence or absence of secondary hairs, and other details. Thus the description of the larva of *Stenoptilia pterodactyla* extends to six pages, whilst the habits of the larva occupy two additional pages. Everyone knows this common species, but how few know where and how the young larva hibernates. A perusal of the account of the imago of *Adkinia bipunctidactyla* will serve to show how completely all the observations of previous authors have been digested and tested. In reading the descriptions of the ova, however, we frequently find no mention made of the micropyle; this is, of course, a highly essential structure, and its appearance might well be noted.

Perhaps one of the most startling discoveries concerning the Alucitids was that made in 1904 of the food-plant of *Buckleria paludum*. The detailed account of this species is exceedingly interesting reading. We have yet, however, to learn whether the larva gains any extra protection by feeding on *Drosera*—whether, for instance, parasitic insects attacking the larva may sometimes be foiled in their attempts by the glandular hairs of the plant.

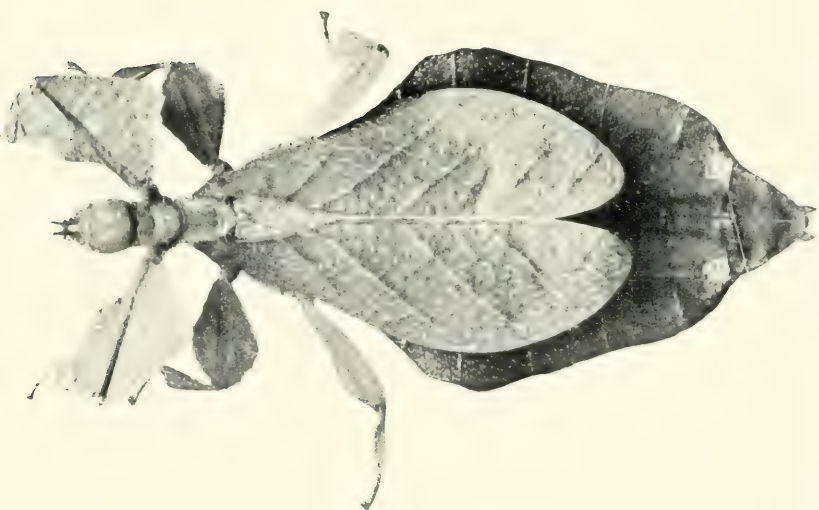
This volume contains, besides the natural history of the Alucitids, very interesting chapters on the hybridization and mongrelization in Lepidoptera.

Mr. Tutt's volumes are now so well known and appreciated by all entomologists that it appears quite unnecessary to call attention to their intrinsic value, but the amount of original research contained in the volume under notice certainly equals that of any of the previous volumes. We have here such a truly excellent account of the Alucitids as a whole, and of the score of species now dealt with, that this volume must long remain the standard work on the subject, and must ever be digested by any author essaying in the future to write a history of the Plumes.

A. S.



A. Nymph ♀.



B. Imago ♀.

PULCHRIPHYLLUM CRURIFOLIUM, Servith.



C. Imago ♂.

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LIFE-HISTORY OF *CHRYSOPHANUS DISPAR* VAR. *RUTILUS*.

By F. W. FROHAWK, M.B.O.U., F.E.S.



Gynandrous *Chrysophanus dispar* var. *rutilus*.

THROUGH the kind assistance of the Hon. N. Charles Rothschild, I received from Austria three living females of *Chrysophanus dispar* var. *rutilus* on June 4th, 1906; these were at once fed and placed on two growing plants of the great water-dock (*Rumex hydrolapathum*). The following day I found a few eggs were deposited, and many more were daily laid for about a week. On the 15th I examined the plants and counted 202 eggs had been deposited on one plant by two females, and 140 on the other, the production of one female. I then put the latter female on a plant of common dock, upon which she deposited 21 more eggs, having altogether laid 161. The two other females I placed on another plant of *R. hydrolapathum*: these again deposited a further supply of eggs, amounting to 50 more, making 252 by the two females; the three parents produced in all 413 eggs. They lived in captivity for about three weeks, and continued depositing during the greater part of the time. The eggs are laid singly and scattered over both surfaces of the leaves, sometimes laid in little groups of three or four. They are small in proportion to the butterfly, being only slightly larger than *C. phlæas*, measuring only $\frac{1}{40}$ in. wide and $\frac{1}{70}$ in. high. It is shaped like a coronet, with a bold cellular pattern on the

crown; the micropyle is sunken, which is surrounded by about six or seven (varying in different specimens) crescentic cells; these are followed by about the same number of much larger cells, and round the sides the cells become very much less, altogether disappearing before reaching the base, which is somewhat irregularly fluted. The walls of the cells are well developed, standing in high relief, and form a fairly regular flower-like pattern, the cells being deep excepting those below the bulging side of the egg. The whole of the upper surface is finely granular, resembling rough, white, oxidized silver with shadows of greyish green; the basal fourth is shining transparent green; the base is deeply embedded in gluten, adhering it firmly to the leaf. Before hatching they turn to an opaque creamy white colour. They started hatching on June 21st, remaining in the egg state sixteen days. The young larva emerges by eating a circular hole in the crown, but does not feed on the shell after it is free, merely eating away a hole to allow its escape.

Directly after emergence the larva measures only $\frac{1}{22}$ in. long, the rather large head is olive-yellow with pale amber-brown mouth parts, a brown Λ on the face, and black eye-spots; the first segment is compressed and projecting in front, overlapping the head, the remaining segments humped dorsally, sides sloping and concaved, and a swollen, dilated, lateral ridge. Along the dorsal surface are two rows of very long, white, finely serrated hairs, two pairs on each segment closely placed, all curving backwards, and on each segment along the lateral ridge are three more similar hairs projecting laterally, and slightly curving downwards; these form a projecting fringe all round the larva; on the ventral surface are short, whitish, simple hairs; on the front of each segment is a subdorsal, minute, brownish hair with a dark base, and three other still smaller white ones on the side, they are all extremely minute; above the black spiracle is a black spiracular-like disc. The entire surface is a light citrine-yellow, and covered with granulations.

Directly after quitting the egg it crawls to the under surface of the leaf and eats into the cuticle and lies in the furrow eaten out, with the lateral fringe of hairs lying flat on the surface overlapping the edges of the furrow. After making a little channel, often not more than its own length, just to lie in, it moves to another spot and eats out another groove, and so on to another, so that after feeding for a few days, several little transparent channels of various lengths are cut in the leaf, but not perforated, as they leave a thin membrane on the upper side. If a portion of the leaf is curled over so as to leave the under surface uppermost, they then feed on the upper cuticle; therefore they are indifferent on which surface they feed, so long as they are underneath. They crawl rapidly, and appear to be continually feeding.

(To be continued.)

NOTES ON THE REARING OF LEAF-INSECTS IN CAPTIVITY.

BY W. H. ST. QUINTIN, F.E.S., &c.

(Continued from p. 75.)

(PLATE IV.)

ON March 15th the first female imago appeared. Two days later it was seen pairing with one of the males. The first ova were laid on April 1st. As the ovum is being laid the insect bends its abdomen back, and suddenly straightens it, releasing the egg at the same time, which is jerked to some distance. Some of the females on a bush, not enclosed in the cage, fling their ova about the small stove-house. One egg was found on the opposite stage across the gangway that runs down the middle of the stove; another was shot on to the stage in the corner of the house four feet from the *Ilex* plant. The purpose is probably to ensure the distribution of the offspring.

Both males and females in the perfect state continue to feed freely. In the female the under wings are rudimentary, and the most that she can do with her large leaf-like elytra is to ease the force of an accidental fall. The male, on his gauzy wings, is quite capable of a flight of at least a few yards, and is altogether a much more active, sprightly insect than the female. After dark the males flew from side to side of the cage with such violence that we were careful not to show a light near them, lest they should injure themselves if disturbed.

Of the insects reared, about one-half were of each sex. The first male assumed the imago state about a month before the first female, and I have a note that, after less than another month, the males began to die off. At the present date (May 18th) only one male remains alive. This one has been seen to pair with three different females, and is still feeding and lively. I have already over three hundred and fifty eggs, and shall be very pleased to present some to any of your readers who would like to rear these very interesting insects. Anybody who can ensure a moist atmosphere and a temperature not less than 65° Fahr. should succeed. I hope to prove, in the coming season, whether, as is the case with *Bacillus*, *Phyllium* is able to continue its species by parthenogenesis.

For the figures I am much indebted to my friend Mr. Digby Legard.

EXPLANATION OF PLATE. — A, a female nymph; B, an imago, also female; C, a perfect male. I regret that I did not think in time of securing photographs of the male in the earlier stages. If successful again this year I shall remember this omission.

DESCRIPTION OF A NEW GENUS AND SPECIES OF
THE SUBFAMILY CLYTRINI (PHYTOPHAGOUS
COLEOPTERA) FROM AUSTRALIA.

BY MARTIN JACOBY, F.E.S.

LEASIA, gen. n.

Elongate, parallel; head very broad, without distinct epistome; eyes oblong, rather small, entire; mandibles broad and robust, strongly pointed; antennæ with second and following joints submoniliform, gradually widened, terminal joints slightly broader than long. Thorax transverse, more than twice as broad as long, sides nearly straight. Scutellum ovate. Elytra punctate-striate, with rows of fine hairs. Legs short and robust, tarsi short, the first joint slightly longer than the second, claws simple. Prosternum very narrow and elongate.

This is the second genus and third species of the subfamily Clytrini known from Australia. It forms part of the group *Megalostomæ* of Lacordaire, and bears a close resemblance to the South American genus *Megalostomis*, from which it differs in the shape of the head, which forms a single frontal surface without the slightest depression; the antennæ, instead of being serrate as in *Megalostomis*, are simply thickened. An enormous contrast is presented by the extraordinary small size of the insect, being one of the smallest, if not the smallest, of all the Clytrini; while, on the other hand, *Megalostomis* is represented by insects of the largest size of that group.

The species has been sent to me by Mr. A. Lea, the curator of the Entomological Department of Hobart Town, who has lately contributed a valuable monograph of the Australian Cryptocephalini, and after whom I have named this genus.

Leasia australis, sp. n.

Black; antennæ, tibiæ, and tarsi more or less fulvous. Thorax impunctate, opaque; elytra more shining, minutely punctate-striate, with rows of fine pubescence. Length, 2 mm.

Hab. Karridale, North Australia.

Head impunctate, opaque, anterior edge of clypeus trisinate, labrum fulvous, mandibles robust; antennæ extending to base of thorax, fulvous, sixth and following joints widened but not serrate. Thorax more than twice as broad as long, sides nearly straight, very narrowly margined, median lobe of basal margin scarcely produced, surface black and opaque like head, with some minute widely dispersed punctures. Elytra with very fine and closely arranged rows of punctures, and extremely fine and short hairs likewise arranged in rows (only visible in well-preserved specimens); legs and tarsi sometimes more or less fulvous.

Male.—Head and thorax very broad, mandibles robust.

Female.—Head much narrower, mandibles very small.

BUTTERFLIES OBSERVED DURING A SHORT TOUR IN SOUTHERN FRANCE IN MAY, 1907.

BY H. ROWLAND-BROWN, M.A., F.E.S.

It has not been my experience before to make a prolonged entomological tour in the month of May on the Continent, and this perhaps lent additional zest and pleasure to my last visit to France. For some years past I have been endeavouring to collect material relative to the distribution of the Macro-Lepidoptera throughout this country, but, though I have been fairly successful, there are still many absolute blanks upon the map which registers the departments for which no records exist, or for which I have been able to get no permanently valuable information. My chief uncoloured areas embrace the eastern frontier departments from Ardennes to Haute-Saône, the country lying westward of the Cevennes and south of Cantal, and a wide field in Central France, stretching chiefly in a south-easterly direction. But it is only necessary to traverse these last two regions by day to understand the reason for the paucity of entomological references. Great plains, with every square acre of land cultivated and husbanded with such care as can only be seen in a country of peasant proprietorship—a scarcity of woodland enclosures, and of trees in general—these conditions offer little attraction to the entomologist who concerns himself chiefly with such insects as are not merely “nuisibles.” Yet, I dare say, round Limoges, the reputed northern limit in the west of *Chrysophanus* var. *gordius*, and in the warm upper valleys of those tributaries of the Dordogne, the Lot, and the Tarn, there are innumerable hunting-grounds lying unexplored, as there are picturesque towns and old-world villages hardly known to the majority of Frenchmen themselves.

The day I left Paris for Rocamadour—May 3rd—was unpromising enough, and not until sunset did the skies clear, as I fondly imagined, for the familiar unbroken blue of the “Midi.” But next morning, when I woke to as perfect a spring day as ever inspired the poets of Guienne, I was not a little surprised to find vegetation hardly more advanced than I had left it in England; the poplars in the deep warm valley of the Alzou were still greener with the mistletoe, which especially affects them, than with their own foliage; the vine-tree over the door of the delightfully primitive hotel had hardly broken bud, and I was hailed as the first tourist. The sunny slopes of the ravine, to the side of which clings this interesting village, were, however, clothed with wild flowers, and here and there great bushes of the giant-fennel, suggestive of *Papilio machaon*; while the several platforms in the rock which mark the pilgrim-road for the faithful

to the shrine of St. Amadour were golden with a tiny dwarf hawkweed. But *machaon* I did not meet with, though *P. podalirius* was almost the first butterfly to greet me, with a plenty of *Gonepteryx cleopatra*, *G. rhamni*, some immense *Pieris brassicae*, *Pontia daplidice* var. *bellidice*, *Anthocharis belia*, and a number of *Colias edusa* and *C. hyale*, of which latter species I was particularly anxious to observe the female in the act of ovipositing; but for some perverse reason all the *hyale* here appeared to be males. In addition, I also noted fresh *Pararge megæra*, and one *P. mæra*, with occasional *C. phlæas*, *Polyommatus icarus*, *Nisoniades tages*, and one or two hybernated *Eugonias polychloros* flying over the bay-trees in the chapel garden. But above on the *causse*, or plateau land, and during a drive of some two miles or more to the nearest station, though the day was brilliantly fine, there was nothing on the wing. Indeed, the barren rocky wastes, grazed (?) by sheep of the type familiar to the Noah's ark of our childhood, and the origin of the heady Roquefort cheeses, were suggestive of anything but an abundant butterfly fauna.

After leaving Rocamadour my entomological diary received no additions worth recording for some days. The weather became cool, overcast, and windy, than which climatic conditions there are none more trying to the patience and the temper of the collector. From Albi I moved on to Toulouse, where it poured incessantly, and from Toulouse I passed on to Montpellier, intending to collect for a day or two in a country which appears to have been somewhat carefully investigated by French collectors about thirty or forty years ago. The weather, however, was again abominable, though I had a lovely day at Carcassone (May 6th), where I noticed, in the dry moat of the famous Cité, a few specimens of *Carcharodus althææ*, and *P. podalirius* not uncommon over the sloe-bushes. My first successful day, indeed, did not come before the 10th, when I found myself on the *voiture publique*, which conveys tourists to and from the Pont du Gard to Remoulins Station, reached from Avignon. But the backwardness of the season was very apparent as soon as I had dismounted and unfurled my net for a preliminary hunt in the little glens, and on the undulating waste lands which lie to the south-west of the Gardon. The forest-trees were as yet hardly in leaf. But all the slopes were glorified by great streams of full-flowering asphodel, flowing and overflowing from the sunny uplands, and a tall yellow *Senecio*. It was, however, in the valleys that such butterflies as I found occurred, and among them *Thais* var. *medesicaste*, males for the most part, and in absolutely fresh condition. *Euchloë euphenoides*, very small, both male and female, were flitting about the *biscutella* plants, with here and there an occasional *E. cardamines*. *Melitæa cinxia* also was well to the fore and fine, and a few *Leucophasia sinapis*. But, to my complete surprise, when I crossed the bridge and

ascended to the ground above the Pont, there was hardly a butterfly to be seen where, on the last day of March, 1902, the ground was alive with all the spring butterflies. I made my way back, therefore, very soon to the opposite bank, but *Hesperia sida* was evidently not out, and only a few worn *Callophrys rubi*, *Polyommatus baton*, and *Pontia daplidice* var. *bellidice* put in an appearance. The next day at Avignon, in a quarry near the Ville-neuve, *M. phœbe* was just emerging, and in the citadel garden I noticed *Papilio machaon* for the first time.

Leaving Avignon on the 11th, I found myself that evening once more back in the 'Boyer-Mistre' at Digne, which hotel, I may add, for the benefit of intending visitors, has been very much smartened up, the electric light installed throughout, and the sanitary arrangements completely overhauled. Madame Mistre, known to so many British entomologists, has retired, however, from the immediate management of the house, but their comforts will not be overlooked. As on the plains, still more conspicuous in the Basses-Alpes, was the lateness of the season. The plane-trees were only just beginning to leaf, the willows and the lesser forest-trees barely clothed with green, though I did find more favoured places, notably on the little rent in the hills which is the butterfly-hunter's staircase to La Collette—and fine collecting ground all the way up—situate to the left of the Dourbes Road, about half a mile from the Octroi. Here *Melitæa aurinia* var. *provincialis* was abundant, with occasional *M. cinxia*, *M. phœbe*, *Brenthis euphrosyne* (large and fiery), and females of *B. dia*, the first brood of which, in the ordinary course of events, comes in late March. Again, on the top of the hill, on the sweet-scented wild thyme, I found a single belated *Erebia epistygne*, female. My chief reason for ascending to the summit was *Anthocharis bellizina* var. *tagis*, and I actually bagged a couple of specimens within five minutes, though on that and a second climb I never saw this dainty little butterfly again; nor was it apparently emerged on the foot-hills of the Doubs, where, I am given to understand, it occurs not infrequently. *Pontia* var. *bellidice* was, however, common, *Anthocharis belia* evidently on the wane, and both males and females of *E. cardamines* common, the latter especially so, as it seemed, for I was netting every Anthocharid, without an orange tip, that crossed my path in hopes of securing the elusive *tagis*. But by far the commonest insect on the wing was *Nomiades cyllarus*, which simply swarmed in the little damp gully just off the Dourbes Road, and also in the dry bed of the stream which runs down the Eaux Thermales valley. With them were occasional males of *P. bellargus*, in all the splendour of an early emergence, not a few *N. melanops*, the males still perfect, and here and there single specimens (all males) of *P. baton*, *C. sebrus*, *Eviás argiades*, and *P. icarus*. *Leucophasia duponcheli* was, however, decidedly rare wherever it occurred, and, as my half-dozen captures were

again all males, I conclude that the species this year was especially late. After hearing a good deal also of the growing scarcity of *Thais medesicaste* at the hands of local dealers, it was pleasing to notice that even in its old haunts there were plenty flitting about in the neighbourhood of the *aristolochia*, and quite a quantity at the back of the Eaux Thermales Hotel, where I do not remember to have encountered it in previous years. It is also interesting to observe, I think, that wherever *Gonopteryx cleopatra* was in evidence both males and females of *G. rhamni* were in attendance. In the "*alexanor* valley," a little above the Bathing Establishment, however, known to most of our collectors, there was a general scarcity, and the stream for the greater part of the way was still monopolizing the pathway from which later in the year I have taken so many interesting species. But here I came across the first male *Erebia evias*, in magnificent condition, though a few days later it was much commoner on La Collette, lopping lazily about just beyond reach of the net as a rule, on the steep precipice which falls away from the summit of that lovely hill. Yet it was by no means confined to "the tops," and I noticed several—the single female I took on the 16th among them—in the river-bed itself. At the foot of the hill in question I also saw a solitary male *Carcharodus lavateræ*, *H. alveus* being commoner further along the Dourbes Road with *P. sao*, and higher up in the woods—the only butterfly observed there—*Nemeobius lucina*, which again was very common in most of the copses and wooded slopes round Digne, now beautiful with flowering cytissus, the wild medlar, white hawthorn, and a sweet-scented yellow jessamine, familiar to me as a garden shrub in England. With more sun I have no doubt my list of captures would have been considerably longer; as it was, I had one whole wet day of the six spent in the Basses-Alpes, and four at least when the cloudy sky and high wind precluded much success among the butterflies. I append, however, a list of the species actually met with at the several places visited, in the hope that it may serve as some indication to those who in the future find themselves in the regions hurriedly toured by me at this particular season of the year:—

ROCAMADOUR (Lot).—*Papilio podalirius*, *Pieris brassicæ*, *Pontia* var. *bellidice*, *Anthocharis belia*, *Colias edusa*, *C. hyale*, *Gonopteryx cleopatra*, *G. rhamni*, *Eugonia polychloros*, *Pararge mæra*, *P. megæra*, *Polyommatus icarus*, *Chrysophanus phlæas*, *Nisoniades tages* (May 4th).

PONT-DU-GARD (Gard).—*Thais* var. *medesicaste*, *Euchloë euphenoides*, *E. cardamines*, *G. cleopatra*, *C. edusa*, *Leptosia sinapis*, *Melitæa cinxia*, *P. icarus*, *Cupido minima*, *P. baton*, *Callophrys rubi* (May 9th).

AVIGNON (Vaucluse).—*P. machaon*, *A. belia*, *P. var. bellidice*, *E. euphenoides*, *Aglaia urticæ* (apparently just out by the

freshness of the specimens ?), *Pyrameis cardui*, *M. phœbe* (May 10th).

DIGNE (Basses-Alpes).—In addition to all the above, *Carcharodus lavateræ*, *C. althææ*; (and at Carcassone, Aude), *Hesperia alveus*, *H. malvæ*, *Pyrgus sao*, *Chrysophanus dorilis*, *Nomiades semiargus* (1), *N. cyllarus*, *N. melanops*, *Polyommatus bellargus*, *P. hylas*, *Everes argiades*, *Cyaniris argiolus*, *Nemeobius lucina*, *Pieris rapæ*, *P. napi*, *L. duponcheli*, *A. tagis* var. *bellizina*, *Brenthis euphrosyne*, *B. dia*, *Melitæa aurinia* var. *provincialis*, *Ewanessa antiopa*, *Pararge egeria*, *Cœnonympha pamphilus*, *Erebia erias*, and *E. epistygne*—being representative of fifty-three species in all.

Harrow-Weald : June 5th, 1907.

COLLECTING LEPIDOPTERA IN THE LAKE DISTRICT IN 1902, 1903, AND IN 1905, 1906.

BY A. H. FOSTER.

(Concluded from p. 133.)

On Lingmoor *Larentia cæsiata* swarmed, as indeed it did on the rocks on all the mountains visited. Another very common insect everywhere was *Hypsipetes sordidata*, showing every grade of variation, from greenish or grey to totally black, the darker specimens being the commonest. Other insects taken on the heather were:—*Chelonia plantaginis*, *Venusia cambricaria*, *Acidalia fumata*, *Strenia clathrata*, *Fidonia atomaria*, *Oporabia filigrammaria*, *Larentia didymata*, *L. salicata*, *L. olivata*, *L. pectini-taria*, *Eupithecia nanata*, *Cidaria immanata*, *C. russata*, *C. testata*, *C. populata*, *Charæas graminis*, *Calæna haworthii*, *Agrotis porphyrea*, *Anarta myrtilli*, *Plusia gamma*, and *Euclidia mi.* During our last week in 1902 we sugared some trees near the edge of Blea Tarn with great success, the most important insects obtained being *Xylophasia lithoxylea*, *X. monoglypha* (a nearly black variety in abundance), *X. rurea* and var. *combusta*, *Mamestra furva*, *Apamea gemina*, *A. didyma*, *Noctua festiva*, *N. rubi*, *Polia chi* and var. *olivacea*, *Aplecta nebulosa*, *A. tincta*, *Hadena adusta* (dark), *H. pisi* (dark), and *H. oleracea* (dark).

Dusking near Blea Tarn in 1902 produced *Nudaria mundana* in abundance, and this insect also came to light.

The next season (1903) we could find nothing of any importance at sugar, and *N. mundana* was absent, though there was only a week between the dates in the two seasons. *E. epiphron*, however, was abundant both in 1902 and 1903.

In 1905 and 1906 I went to a farmhouse at Stool End at the foot of Bow Fell. I was there for the first fortnight

of August in 1905, and the last fortnight of August in 1906. Of *E. epiphron* there were none, *P. interrogationis* none, but *Larentia salicata* was very abundant in both years. This insect is particularly common on the rocks on Bow Fell, but is perhaps best obtained by walking along the stone walls, when, by waving the net about near the wall, the insect flies off, and is easily captured. Another insect which I took on Bow Fell (and nowhere else) was *Larentia flavicinctata*, which was obtained from the rocks in the same manner. Both these insects are accompanied by an abundance of *L. cæsiata*, and it is necessary to take every possible insect which flies off in case it may be *L. flavicinctata*, which is not an insect to be despised.

In 1905 I also discovered that the large patches of juniper which are found on Lingmoor, Bow Fell, and elsewhere were swarming with a beautiful dark variety of *Eupithecia sobrinata*, and I obtained the same insect again in 1906. In the latter year, also, I took one specimen (and missed two others) of *Thera simulata* in the juniper on Bow Fell, but did not meet with it elsewhere.

Other insects to be noted are:—

Stilbia anomala, of which I took three specimens, all kicked up by chance out of the long grass—one on Bow Fell, one on Langdale Pikes, one on Lingmoor.

Chelonia plantaginis, which occurred in 1902 and 1903 chiefly on the tops of high mountains in company with *E. epiphron*; I could never find var. *hospiton*, though I searched several times on Helvellyn.

Coremia munitata, fairly plentiful among bracken and in long grass on the sides and tops of high mountains.

Larentia olivata occurred every year in small numbers, always in a worn state, chiefly in the clefts in which the streams run down the sides of the fells, where there are overhanging rocks.

Cidaria testata, which occurred abundantly everywhere, particularly in the heather. This is noticeable as occurring almost entirely as a beautiful lilac variety. I took no yellow ones whatever.

I have never met with *Erebia blandina* nor *Cænonympha typhon*, nor with the variety of *E. epiphron* in which the black dots have white centres (? var. *cassiope*, or is this the type and the other the variety; or is this *epiphron* and the one without white centres *cassiope*?).

The following insects complete the list of all those taken or observed in the district during the four seasons:—*Pieris brassicae*, *P. napi*, *P. rapæ*, *Gonepteryx rhamni*, *Argynnis selene*, *Vanessa io*, *V. atalanta*, *V. urticae*, *Epinephele ianira*, *Cænonympha pamphilus*, *Polyommatus phleas*, *Lycæna icarus*, *Hesperia sylvanus*, *Hepialus humuli*, *H. velleda*, *Cossus ligniperda*, *Arctia lubricipeda*, *A.*

menthastri, *Macrothylaria* (*Bombyx*) *rubi* (larvæ), *Boarmia repandata* (dark), *Hemithea strigata*, *Eupithecia vulgata* (dark), *Melanippe subtristata*, *M. montanata*, *M. fluctuata*, *Camptogramma bilineata*, *Tanagra atrata*, *Notodonta dictæoides*, *Leucania impura*, *L. pallens*, *L. conigera*, *L. lithargyia*, *Mamestra brassicæ*, *Agrotis segetum*, *A. exclamationis*, *Triphæna pronuba*, *T. orbona*, *Noctua xanthographa*, *Phlogophora meticulosa*, *Euplexia lucipara*.

13, Tilehouse Street, Hitchin.

DESCRIPTION OF TWO NEW SPECIES BELONGING TO THE FAMILY NYMPHALIDÆ.

BY EMILY MARY SHARPE.

Euryphene braytoni, sp. n.

♂. Fore wing bluish black, the central area metallic blue, costal and hind margins brownish black. The dark apical area relieved by a transverse band of three white hastate spots suffused with pale blue. Hind wing entirely metallic blue, the costa, hind and inner margins, brownish black. Under side: Ground colour brown, with a green suffusion over the upper half of the wing, a submarginal border of brown spots along the hind margin, and two distinct brown spots in the discoidal cell, the white apical band nearly obsolete; the costa at the extreme base bluish white. Hind wing similar in colour to the fore wing, two brown spots in the cell, a whitish spot near the costa, situated near the centre of the wing, followed by a faint white line, but only as far as the first subcostal nervule. Expanse, 2·7 in.

♀. Similar in colour to the male, the metallic blue on both wings somewhat brighter in colour. On the fore wing the white apical band broader and more strongly marked, a white spot at the extreme apex of the wing. Under side exactly similar to that of the male, the brown transverse band on the fore wing more strongly indicated than in the male. Expanse, 3·3 in.

This species is allied to the *E. sophus*, Fabr., and *E. aurora*, Auriv., group, but is distinguished from both by its beautiful blue colour. The sexes are alike, which is not usually the case in this genus.

Euphædra cottoni, sp. n.

Fore wing black, with a large patch of metallic blue on the inner margin, extending to the base and along the costal margin. A transverse band of yellow spots crosses the apical area; these spots are situated between the nervules. Hind wing entirely metallic blue, the costal, hind, and inner margins black, the hind margin having a submarginal row of blue spots. Under side: Ground colour somewhat greener than in *E. rezia*, the costa yellow, the apex of the fore wing white, the black submarginal spots not so strongly marked. Hind wing green, suffused with yellow on the inner margin, the black spots and

markings fainter and smaller; the white band crossing the discal area only faintly indicated. Expanse, 4.1 in.

This species is closely allied to *E. rezia*, but differs from that species in having the yellow apical band on the fore wing. It may, therefore, be only a local form, as the genus varies tremendously.

These specimens were collected in the Ituri Forest, Congo Free State, between Irumu-Mawambi-Beni, elevation between 2950–2100 ft., by Major Powell Cotton in the year 1905, and during the months of June to October.

NOTES ON COLLECTING DURING 1906.

BY THE REV. W. G. WHITTINGHAM.

(Concluded from p. 130.)

My visit to Cornwall, thanks in good measure to the kind offices of Mr. J. Peed and Mr. George Oliver, was very enjoyable. *Lycæna arion* was in large numbers, and in splendid condition. A good series of *Leucophasia sinapis* was secured, together with several *Argynnis selene* and *aglaia*, *Melanargia galatea*, and *Epinephele hyperanthus*. *Euchloë cardamines* and *Thecla rubi* were flying in perfectly good condition on July 4th, and a day or two after. This I was told was generally observed. *Thecla rubi* was in plenty. Was it a second brood, or only a continuance of the one brood? And what about *Euchloë cardamines*? Cornwall would seem to be the last county in which one would expect to find late emergences. Several *Vanessa cardui* were about here. *Sesia musciformis* was plentiful among the thrift, and *Arctia villica* was seen on the wing in the hot sunshine. Amongst Noctuæ, *Miana arcuosa* (both sexes), and *Agrotis lunigera* and *A. lucerneæ* were taken at rushes and heath-flowers. Sugar produced nothing but such insects as *Apamea gemina*, *Miana strigilis*, and *Rusina tenebrosa*. *Acidalia subsericeata* was in some numbers, and the following Geometers were also netted:—*Bapta temerata*, *Emmelesia affinitata* and *alchemillata*, *Eupithecia jasio-neata*, *constrictata*, *nanata*, *pumilata*, and *Anticlea rubidata*. *Scoparia dubitalis* swarmed upon the sea-front, and *Botys terrealis* (getting over), *Stenia punctalis*, *Nomophila noctuella*, and *Crambus uliginosellus* were also taken. Only three "plumes" were observed—*Mimæseoptilus bipunctidactylus*, *Edematophorus lithodactylus*, and *Leioptilus tephradactylus*.

The Micro-Lepidoptera did not seem to be very numerous. The Tortrices noticed only included such common insects as *Sericoris lacunana* and *urticana*, *Penthina pruniana*, *Orthotænia*

striana, *Bactra lanceolana*, *Conchylis straminea*, *Spilonota roborana*, *Catoptria cana*, *Eupæcilia angustana*, *Chrosis alcella*, *Sciaphila subjectana*, and *Argyrolepia cnicana*. *Eupæcilia hybridella* occurred, and among Tineæ, *Lita marmorea* (very varied), and two specimens of *Lampronia prælattella*. Close searching at various times of the day and evening failed to reveal any more than these two.

The larvæ of *Eupithecia venosata* were plentiful among *Silene maritima*, and a few *Polia xanthomista* were discovered, which duly produced moths at the end of August.

On Monday, July 30th, I commenced a holiday, not altogether of an entomological character, at Ullswater, and bethought myself that by an early start I might secure something on the way. Accordingly I bicycled over to Rugby late on Sunday evening, and caught a night train to Carnforth, which enabled me to get a wash and some breakfast, and be at Arnside-Knott as early as butterflies were likely to be on the wing. After some search I succeeded in taking a couple of examples of *Erebia blandina*, evidently freshly emerged. Soon after the sky became overcast, and the rumbling of distant thunder made it evident that my chance of getting any more was at an end for that day; so, leaving the Knott, I presently found a train to take me across the estuary to Grange, and had a few hours on the moss at Witherslack; while the constant thunder from the storm-clouds over the Knott told me I had done wisely to come away. By three o'clock I had to leave, and had a delightful ride by the side of Windermere and over the Kirkstone Pass to Ullswater. I came back a week later for a second attempt to get a series of *blandina*, but again storm-clouds were covering the Knott, and made it hopeless, so that once more I confined my attention to the moss.

The storm, indeed, was not so kind as on the previous occasion, for hardly had I got well on to the moss when the storm broke, and both I and the moss were soaked. However, I stuck to it, with such shelter as the pines afforded, and by and by the sun came out, and presently insects were walked up. A few *Cœonympha typhon* were still on the wing on the earlier visit, though worn, and *Lycæna ægon* was also flying, the females presentable. *Nemeophila plantaginis* was in perfectly good condition, and so were a couple of *Anarta myrtili*. *Selidosema ericetaria* was in some numbers, the males mostly worn, but I only turned up four specimens of *Carsia imbutata*. I secured eggs from *ericetaria*, but I cannot say I am very sanguine as to the larvæ having got through the winter alive. *Hyria muricata*, *Crambus margaritellus*, and *Retinia buoliana* were netted, and a fair series of *Amphisa gervingana*. *Mixodia schulziana* was abundant, and in resplendent condition. On my way back to Ullswater I found two larvæ of *Cucullia asteris* on *Solidago* in a wood, and should

doubtless have obtained more if time had permitted a good search.

In the neighbourhood of Ullswater *Larentia cæsiata* swarmed on the rocks in places, and in one spot *L. olivata* was plentiful. I obtained a good many ova of the last-named species; they hibernate when very small, and it is difficult to know what to do with them. I fear I have lost them all. A partial second brood of *L. salicata* appeared, and the small mountain form of *L. didymata* flew in the afternoon sun. *Eupithecia sobrinata* was plentiful among the juniper, and some interesting forms were taken. I found a few larvæ of *E. valerianata*, and one or two examples of *Coremia munitata* started up and were boxed half-way up Helvellyn. *Cidaria populata* and *Hypsipetes sordidata* were especially interesting. The females of *populata* were all distinctly smaller than those I have seen elsewhere, and were typical in coloration. The males were normal in size, but varied in colour. Most were darker than our Midland form; one or two had the inner marginal area or the whole wing suffused with darker, and several were altogether brown, almost chocolate, with the markings partly obliterated. *Sordidata* was very varied, presenting both green and fuscous forms. *Cidaria testata* was also of quite a distinct colour, a dusky brownish grey, rather difficult to describe, replacing the usual reddish grey, the general impression being brownish violet instead of ochreous. I found several *Stilbia anomala* settled on the heather by searching after dark, but nothing flew to light; nor was sugaring productive of anything better than *T. comes* and *pronuba*, *N. xanthographa*, and *X. monoglypha*, though of these last the dark variety was as prevalent as the light form.

Two or three days at Seascale were rather disappointing, entomologically, though otherwise pleasant enough. The August Agrotids, *vestigialis*, *tritici*, &c., came to sugar on the sand-hills, but very sparsely, and a few *Miana literosa*. That was all. A specimen of *Tapinostola fulva* was found newly emerged on a rushy patch in a dip of the sand-hills on August 21st, and I netted a female *Luperina cæspitis*, which was kind enough to lay me a quantity of eggs, which have just hatched. I have also some of the hibernated and now feeding progeny of a *Geometra papilionaria*, which I took at rest. The record of several specimens of *Polyommatus phlæas*, some of them with blue spots on the hind wings, completes my notes of this holiday.

Knighton Vicarage, Leicester.

CURRENT NOTES.

BY G. W. KIRKALDY.

106. WARD, J. J.: "The Life Story of the White Admiral Butterfly." Strand Magazine (American Edition), xxxii. 303-9, text figs. 1-16 (October, 1906).
107. CRAW, A.: "Report of the Superintendent of Entomology and Inspector" (including Reports by J. KOTINSKY). 2nd Rep. Board Agr. Forestry Hawaii, 99-166, plates vii.-viii., text figs. 1-11 (October 13th, 1906).
108. MATSUMURA, S.: "A Summary of Japanese Cicadidæ . . ." Annot. Zool. Jap. ii., 1-20, plate i. (February 25th, 1898). [Hemiptera].
109. *Id.*: "Monographie der Cercopiden Japans." Journ. Sapporo Agr. Coll. ii., 15-52, figs. 1-22 (1903). [Hemiptera].
110. *Id.*: "Additamenta zur Monographie der Cercopiden Japans, mit der Beschreibung einer neuen Cicada-Art." Annot. Zool. Jap. v., 31-55, plates 2-3 (1904). [Hemiptera].
111. MATSUMURA, S.: "Die Hemiptera Fauna von Riu Kiu (Okinawa)." Tr. Sapporo N. H. Soc. i. 15-38, plate i. (1905).
112. HOPKINS, A. D.: "Some Insects Injurious to Forests: The Locust Borer." Bull. Bureau Ent. (U.S.) 58, pp. 1-16, figs. 1-6, plate i. (June 13th, 1906). [Coleoptera].
113. WEBB, J. L.: "Some Insects Injurious to Forests: The Western Pine-destroying Barkbeetle." *Op. cit.*, 17-30, figs. 7-12, plates ii. and iii. (August 18th, 1906). [Coleoptera].
114. HINDS, W. E.: "Proliferation as a Factor in the Natural Control of the Mexican Cotton-boll Weevil." *Op. cit.*, 59, pp. 1-45, plates i.-vi. (August 27th, 1906). [Coleoptera, &c.].
115. HINE, J. S.: "Habits and Life Histories of some Flies of the Family Tabanidæ." *Op. cit.* (Tech. Ser. 12), pp. 17-38, text figs. 1-12 (August 29th, 1906). [Diptera, &c.].
116. "Proceedings of the Eighteenth Annual Meeting of the Association of Economic Entomologists." *Op. cit.*, 60; 1-206, figs. 1-10, plates i.-iii. (September 22nd, 1906).
117. DIMMOCK, G. W.: "Algunas Coccinellidæ de Cuba." Inform. Estac. Centr. Agron. Cuba i., 287-392, plates 50-2 (June 1st, 1906). [Coleoptera].
118. COOK, M. T.: "Informe del Departamento de patologia vegetal." *Op. cit.*, 147-208, plates 24-9.
119. *Id.*: "Algunas Agallas de Cuba producidas por Insectos." *Op. cit.*, 247-52, plates 47-9. [Diptera].
120. DESNEUX, J.: "Termitidæ o comejenes. Habitos e historia de su vida." *Op. cit.*, 393-407, figs. 1-10, plate 53. [Neuroptera].
121. THEOBALD, F. V.: "Some Notable Instances of the Distribution of Injurious Insects by Artificial Means." Science Progress i., 58-72, figs. 1-3 (July, 1906).

122. NÖRGAARD, V. A.: "Division of Animal Industry—Report for 1905." 2nd Rep. Agr. Forestry Hawaii, 167–228 (October 13th, 1906). [Diptera].
123. KNAB, F.: "The Swarming of *Culex pipiens*." *Psyche* xiii., 123–33 (October, 1906). [Diptera].
124. SLOANE, T. G.: "Revision of the Cicindelidæ of Australia." *Proc. Linn. Soc. New South Wales* xxxi., 309–60, plates 25–31 (October 3rd, 1906). [Coleoptera].
125. HARRISON, L. W. H.: "Variations of *Lycæna astrarche* in Britain." *Bull. Soc. Léop. Genève* i., 30–2 (1905). [Lepidoptera].
126. FERNALD, H. T.: "The Digger Wasps of North America and the West Indies belonging to the Subfamily Chlorioninæ." *P. U. S. Mus.* xxxi., 291–423, plates vi.–x. (No. 1487) (1906).
127. CARY, M.: "On the Diurnal Lepidoptera of the Athabaska and Mackenzie Region, British America." *Op cit.*, 425–57 (No. 1488) (1906).
128. CROMBRUGGHE DE PICQUENDAELE, Baron de: "Larves de Microlépidoptères vivant en août, sur les trembles de la forêt de Soignes." *A. S. E. Belg.* 50, pp. 271–2 (October 4th, 1906).
129. GROSVENOR, G. H.: "Cuba—the Pearl of the Antilles." *Nat. (U.S.) Geogr. Mag.* xvii., 535–68 (including 24 full-page illustrations), 1 map (12 × 24 ins.) (October, 1906).
130. MUIR, F.: "Notes on some Fijian Insects." *Bull. Hawaiian Sugar Plant. Ent.* 2, pp. 1–11, plate i. (November 10th, 1906). [Coleoptera, Diptera, Hemiptera, Hymenoptera].

The "Life Story of the White Admiral Butterfly" (106) will doubtless be interesting to many readers of the 'Entomologist.' The reference is to the American edition of the magazine, which may not be the same as the British.

Craw and Kotinsky's Report (107) deals with a record of the quarantine work of 1905, and of the breeding and dissemination of beneficial insects during the same period. There are also reports on visits to the various islands of the Hawaiian Archipelago. The reports on Lantana Insects and Hornfly are reprinted from the Rep. Hawaiian Livestock Association.

It is interesting to compare the Cicadid and Cercopid faunas of Japan with the similar British ones. In the British Isles there are one Cicadid and seven Cercopids, in Japan sixteen Cicadidæ and forty Cercopids already described (108–110). The naturalists of Sapporo, in Japan, have started a Natural History Society, and published part of the first volume of their 'Transactions.' Matsumura records fifty-six species of Hemiptera from the Riu Kiu (Loochoo) Islands, of which ten are new (111).

Hopkins and Webb (112–113) discuss the life histories of the Cerambycid *Cyllene robinia* and the Scolytid *Dendroctonus brevi-*

cornis respectively, while Hine (115) deals at length in the same way with five species of *Tabanus* and a *Chrysops*. These papers cannot be neglected by British field-workers.

Hinds (114) discusses proliferation in the Cotton Plant—that is to say, “the development of numerous elementary cells from parts of the bud, or boll, which are themselves normally the ultimate product of combinations of much more highly specialized cells. The resulting product is thus composed of comparatively large, thin-walled cells, which are placed so loosely together that the resulting formation is of a soft texture, and has a granular appearance,” plainly to be seen with the naked eye. This proliferation has been ascertained to be the cause of a higher rate of mortality in the terribly destructive boll weevil (*Anthonomus grandis*), death resulting generally mechanically from simple pressure, for the proliferous tissue is not toxic to the weevils.

The Proceedings of the Association of Economic Entomologists (116) are, as usual, of great biological interest. Among the more interesting papers are the following:—(a) “The Scope and Status of Economic Entomology,” by H. Garman (5-24); (b) “The Corn Root-Aphis and its attendant Ant,” by S. A. Forbes (29-41) [Hemiptera, Hymenoptera]; (c) “Observations upon the Migrating, Feeding, and Nesting Habits of the Fall Webworm (*Hyphantria cunea*, Dru.),” by E. W. Berger (41-51, plate i.) [Lepidoptera]; (d) “The Care of Entomological Types,” by T. D. A. Cockerell (51-2); (e) “Notes upon a Little-known Insect Enemy of Cotton and Corn (*Cicada erratica*),” by W. Newell (52-8, figs. 1-2) [Hemiptera]; (f) “History of Economic Entomology in Hawaii,” by J. Kotinsky (58-66); (g) “The Relation of Descriptions to Economical Methods of Eradication in the Family Aphididæ,” by C. E. Sanborn (162-6) [Hemiptera]; (h) The Currant Root-Aphis (*Schizoneura fodiens*, Buckton) [in England], by F. V. Theobald (166-70, figs. 7-9) [Hemiptera]. It should be noted that the “Report of Committee on Nomenclature” (25-8) is on the nomenclature of popular names only.

Dimmock has produced an extensive paper, chiefly biological, on Cuban Ladybirds (117), while Desneux (120) discusses some Termites from the same island. Cook deals (118) with various insect pests, and (119) Dipterous galls, also from Cuba.

Nørgaard (122) discusses the Screwworm Fly (*Comptosia macellaria*) and the Hornfly (*Hæmatobia serrata*).

Sloane (124) revises the Australian Cicindelids; the introductory remarks (309-17) and various notes in the course of the paper are of general interest.

According to the ‘Journal of the Royal Microscopical Society,’ Harrison discusses the British *Lycæna astrarche* and its var. *artaxerxes* (125).

Fernald (126) has monographed the North American and Antillean Chlorioninæ—that is to say, the group formerly known as Sphecinæ, the latter name being now applied to the old Ammophilinæ. The external anatomy is discussed, followed by analytical keys and descriptions of the genus *Chlorion*, its subgenera and species.

Among the Rhopalocera enumerated from Northern Canada are *Eucanessa antiopa*, *Vanessa atalanta* and *cardui*, *Anosia plexippus*, and varieties of *Papilio machaon*, *Pontia napi*, and *Cænonympha tiphon* (127). The Baron de Picquendaele (128) briefly remarks on the larvæ of several Micro-Lepidoptera found in Belgium on the aspen.

An up-to-date map of Cuba (129) has just been published.

Muir (130) gives a brief account of a visit to the Viti Isles in search of parasites, followed by anatomical and bionomical notes on Stylopidae, with description of a new species of Pipunculidae.

ERRATA.—P. 85, line 6, for “reduction” read “redaction”; line 16 from bottom, for “*Ranatia*” read “*Ranatra*”; p. 86, line 7, for “Ageomyzid” read “Agromyzid.”

TORTRIX PRONUBANA, HB., DOUBLE-BROODED IN BRITAIN.

BY ROBERT ADKIN, F.E.S.

FROM what I saw of the earlier stages of *Tortrix pronubana* last autumn, I was so convinced that an earlier emergence would be found to take place that I determined to investigate the matter at the earliest opportunity. This occurred at Whitsuntide, when I was able to spend a few days at Eastbourne. A diligent search of the *Euonymus* hedges produced a number of *Tortrix* larvæ, the bulk of them only too evidently not of the species sought; but among them were two or three suspiciously like those found last autumn, and a pupa that was met with also looked likely in general appearance, but instead of being between two leaves, as was invariably the case with the autumn pupæ, it was enclosed in a single rolled leaf. However, the emergence from this pupa of a fine male, and one example of each sex of the species having resulted from the miscellaneous collection of larvæ, has shown clearly that there are at least two generations of *Tortrix pronubana* in the course of the year in Britain.

Lewisham: June, 1907.

NOTES AND OBSERVATIONS.

NEUROPTERA.—Dr. Chapman was kind enough to hand to me the following insects recently taken by him in France :—One male of the dragonfly, *Sympycna fusca*, Vanderl., taken at Hyères, March 24th to April 9th, 1907 ; two *Holocentropus stagnalis*, Albarda (Trichoptera), which occurs locally in England, taken at the same date and place ; one *Mesophylax aspersus*, Ramb. (Trichopteron), a southern insect (once taken in England, but probably a “casual”), captured at Ste. Maxime, April 10th to 28th, 1907 ; one *Micropterna fissa*, McL. (Trichopteron), another southern insect, taken at the same date and locality as the last.—W. J. LUCAS.

LEAF-INSECTS IN CAPTIVITY.—Mr. St. Quintin's note on the above subject in the April number of this Journal is of great interest. The discovery that these insects can be reared upon beech, oak, and ilex leaves will enable many people in England to have the pleasure of watching the transformations of these most remarkable of tropical insects. The damp atmosphere is a *sine qua non*, both in the hatching of the eggs and the successful raising of the young insects. But I am writing more particularly to correct an error in the name of the species said to have been obtained by Mons. Morton from Ceylon. *Phyllium* (*Pulchriphyllium*) *scythe* is recorded only from Northern India, and is not known to occur in this island. Our commoner Ceylon species is *crurifolium*, and it is probable that this species is the subject of Mons. Morton's paper. It has a range extending through Ceylon, Borneo, and the Seychelles.—E. ERNEST GREEN ; Government Entomologist, Royal Botanic Gardens, Peradeniya, Ceylon, April 22nd, 1907.

BARRETT'S 'LEPIDOPTERA OF THE BRITISH ISLANDS' AND ITS INDICES.—Having agitated for the publication of a Specific Index to Barrett's 'Lepidoptera,' it is only right that I should express our indebtedness to the publishers of that work for having taken the hint, and this I do with much pleasure. I now have a copy of this index before me, and, although its method is not all that could be desired, it will answer a useful purpose, and enable easy reference to a desired species without the necessity of hunting through many pages of closely printed matter to discover where the required information may be found, as was the case before its publication. Such references as *Fuligana*, vol. 10, p. 379 ; *Fuligana*, vol. 11, p. 63 ; *Marginata*, vol. 6, p. 146 ; *Marginata*, vol. 7, p. 274 ; *Rufana*, vol. 10, p. 235 ; *Rufana*, vol. 11, p. 29, and so forth, of which there are several, are worrying, and it is to be regretted that in cases where the same name is used for more than one species some indication of the generic name also is not given ; indeed, it is surprising that with such examples of complete indices as that of Staudinger's 'Catalogue,' 1901, or even the special indices of some of our current periodicals, such omissions should have occurred. It is also to be regretted that the size of the paper on which the index for the large-paper edition is printed is not of the same size as that of the body of the work. These, however, are but trivial defects, and the index will, without doubt, be found exceedingly useful by all those who desire to use the work as a book of reference, and I doubt not that they

will be many. But why have "The Publishers" (*ante*, p. 109) sought to throw the blame for their original omission on the deceased author? Why did they endeavour to construe my words of reverence to his name (*ante*, p. 87) into a "cold douche" upon his life's work? Had they seen fit, in the first instance, to have spent one-tenth of the labour and cost incurred in printing a comparatively useless "List of Plates" in providing a thoroughly up-to-date specific index, there would have been nothing to say. However, we are grateful to the publishers for having given us, even though late, this "Alphabetical List of Species contained in Barrett's 'Lepidoptera of the British Islands'"; the pages of this great work are now open to us, and we can well afford to "bury the hatchet."—ROBERT ADKIN; Lewisham, June, 1907.

PORTHESIA CHRYSORRHŒA.—While at Eastbourne in the early days of this month I chanced upon a bramble patch growing in a sheltered nook close to the sea, which was devastated by the nearly full-fed larvæ of *Porthesia chrysorrhæa*. There must have been some thousands of them, and many of the "nests" in which they had hybernated were found on the brambles. Although I have worked the district pretty closely for the past ten years or more, I have not previously met with this species, nor could I find any other colony in the surrounding country, so far as I was able to explore it. The fact of this isolated colony occurring close to the south-east corner of our island appears to me to suggest very strongly the probability of the parent moths being immigrants, and the recorded fact of the species being "in considerable numbers over a large area" of the South of France last year (*Proc. South London Ent. Soc.* 1906, p. 88) may perhaps also give a clue to their possible origin.—ROBERT ADKIN; Lewisham, June, 1907.

CAPTURES AND FIELD REPORTS.

COLEOPTERA NEAR BARNSTAPLE.—Last year I gave over some of my time to the Coleoptera, without much success as far as rarities go, yet I took several interesting beetles, and am fully persuaded to continue this summer. My two chief collecting-grounds were Braunton Burrows (including Santon and the cliffs) and the valley of the Yeo, at Barnstaple. There is no necessity for me to point out the riches which entomologists are (I almost said were) accustomed to find on Braunton Burrows. The Burrows have an exceptionally low rainfall, and on account of the sands it is probably the hottest part of North Devon in the summer. The Yeo valley is well wooded, but with young trees—oaks and larches. The banks of the river are profuse with large flowering plants, and the smaller members of the *Geodophaga* run over the shingle beaches in thousands. There are very few ponds in Devon, and especially few in the north of the county, and consequently I saw no great numbers of water-beetles. Rocky moorland brooks are of course numerous. The following list, which is by no means one to be proud of, seeing the time I devoted to collecting, contains the most noticeable and most notable forms I came across. Outside Braunton Burrows I consider the Barnstaple district to be

very poor in Coleoptera. Some of the species were taken by my friend Mr. H. H. Hamling, and in those cases I have inserted his name in brackets after the record :—

Cicendela campestris. Common in the Yeo valley.—*Carabus violaceus*. The commonest of the genus.—*C. arvensis*. One specimen on Codden Hill.—*Cychrus rostratus*. In South Devon, near Totnes, I took two under stones, on the border of a larch-wood.—*Leistus ferrugineus*. Frequent under stones and bark.—*L. spinibarbis* and *L. fulvibarbis*. One of each, under stones.—*Nebria complanata*. This is a common insect on the sandy shores of the coast, at Greysands and Santon (under sandstone boulders at the foot of the cliffs) and Woolacombe. Their colouring makes them hard to see on the sand until they move, but they generally remain still in times of danger.—*Broscus cephalotes*. Common in the same localities as last.—*Dyschirius globosus* and *D. impunctipennis*. The Burrows.—*Chlœnius vestitus*. Common at Venn Quarry, Barnstaple; one specimen on the Yeo and a few at Bishopstawton.—*Badister bipustulatus*, *Dromius linearis*, *D. nigriventris*.—*Pristonychus terricola*. Plentiful on the beech at Santon, at the foot of cliffs, and in the dark caverns.—*Anchomenus angusticollis*. Reported as rare here, but it is common in Acland Woods under bark, and at one or two other Barnstaple localities.—*A. fuliginosus*. Under alder bark.—*A. marginatus*. Braunton Burrows; not common; and *A. thoreyi*, Dej.—*Calathus melanocephalus*. Common.—*Dichirotrichus pubescens* and *D. obsoletus* and *Cillenus lateralis*. River Taw.—*Bembidium obtusum*, *B. rufescens*.—*B. pallidipenne*. Plentiful under stones and bits of bark near water, Braunton Burrows.—*Dytiscus marginalis*. Venn Quarry (H. H. Hamling).—*Agabus nebulosus*. Has been taken on Lundy Island; also at Venn.—*Deronectes 12-pustulatus* and *Colymbetes fuscus*.—*Oreochilus villosus*. Under stones on the edge of the Yeo river, taken in daylight.—*Creophilus maxillosus*. Very common; also *Bledius arenarius*.—*Staphylinus cæsaureus* and *Philonthus marginatus*.—*Olophrum piceum*. Yeo valley.—*Megacronus cingulatus*, Mann. One specimen, Acland Woods.—*Ocypus ater*. Common at Santon.—*Atemeles emarginatus*. In large numbers in nest of *Formica rufa* in South Devon, near Totnes.—*Tychus niger*. Common.—*Pyrochroa rubens*. Common on timber.—*Silpha thoracia*. Two in fungus, Acland Woods; and numbers near West Buckland by roadside (H. H. Hamling).—*Atomaria linearis*. About 4½ acres of mangolds were destroyed by these little beetles some time ago. The Board of Agriculture advises that a Strawsoniser be run over the field with ordinary Paris-green wash, and considered deep ploughing advisable. In districts on the Continent where this beetle is a serious pest to sugar-beet, "thick sowing of seed" is practised, and would be worth doing in this country, where the species is over numerous.—*Tritoma bipustulata*. Tawstock Woods.—*Coccinella 14-guttata*. On alders.—*C. variabilis*.—*Sinodendron cylindricum*. One in rotten beech; and also at Lynton (H. H. Hamling).—*Dorcus parallelipedus*. Near the moor in Somerset, but on the Devon border (H. H. Hamling).—*Geotrupes typhaeus*. One specimen, Santon; also a pronotum of female among some remains left by bats, Braunton.—*Heterocercus lævigata*. River Taw.—*Phyllopertha vulgaris* and *Cetonia aurata*. Barnstaple.—*Anomala ænea*. Common at Santon.—*Hoplia philanthus*.

On *Heracleum*.—*Melanotes rufipes*. Two under bark at Venn.—*Lamproyrus noctiluca*. Very common.—*Niptus hololeucus*. Numerous in old cupboards.—*Cleonus sulcirostris* (H. H. Hamling). One at Santon.—*Cionus blattariae*, *Strophosomus coryli*, and *Apoderus coryli*, the latter at Aeland Woods.—*Apion miniatum*, Common.—*Cænopsis waltoni*. Common in moss: woods.—*Otiorynchus atroapterus*. Santon.—*Rhagium inquisitor*. In rotten oak, Clovelly.—*Pachyta 8-maculata*. River Yeo (*vide* 'Entomologist,' November, 1906, p. 259).—*Cryptocephalus lineola* (H. H. Hamling).—*Haltica verbasci*. Very common on the mullein.—*Cassida splendidula*. River Yeo, by beating; one specimen.—*Chrysomela banksii*. Common, especially in South Devon, near Totnes, at Harberton.—*C. hyperici*. Common; and *C. goettingensis*, at Harberton and Venn, Barnstaple; two only.—*Phytodecta olivacea* var. *litura*. On broom, River Yeo.—*Galeruca californiensis*, *G. lineola*, *Adimonia capreae*.—*Calomicrus circumfusus*. On gorse, Codden Hill.—*Typhæa fumata*. Under bark.—*Helops pallidus*. One at Braunton Burrows.—*H. striatus*. Very common under bark.—*Cistela sulphurea*. Common on low plants, Braunton.—*C. murina*. On coast.—*Phaleria cadaverina*. Common under stones and seaweed on the shore.—*Opatrum sabulosum*. Common, Braunton Burrows; also *Heliopathes gibbus*. On sandhills, crawling over loose sand.—*Melandrya caraboides*. On stinging-nettles; one specimen at Venn.—BRUCE F. CUMMINGS; 14, Cross Street, Barnstaple.

LARVÆ IN 1907.—In view of the remarks made by Messrs. Newman and Huggins concerning the scarcity of *Arctia caia* larvæ this season, I should like to give my experience of the Norfolk Broad district. In spite of heavy rains I collected over one hundred in six days, in marshes over which I had hunted the two previous years, and found only a dozen or so. This was in the first week of June each year. There was a great increase in the number of *Odonestis potatoaria* too, and I should be very glad of an explanation of this really remarkable abundance. Is it due to the fact that in this swampy district last summer's extreme drought was favourable to autumn-feeding larvæ? G. BROOKS; Ivyside, North Finchley, June 16th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, June 5th, 1907.*—Mr. C. O. Waterhouse, President, in the chair.—Mr. C. N. Hughes, of Knightstone, Cobham; Mr. Albert Ernest McClure Kelly, Assistant Entomologist to the Department of Agriculture, Natal; and Mr. M. G. Muklie, of Hyderabad, Sind, India, and Cambridge University, were elected Fellows of the Society.—The decease was announced of Dr. Frederic Moore, D.Sc., A.L.S., F.Z.S., the "father" of Indian entomology, and one of the oldest Fellows of the Society; and of Mr. C. J. Watkins.—The President read a communication from the Rev. F. D. Morice, M.A., the Society's delegate to the celebrations in honour of the Linnæan bicentenary celebrations at Upsala and Stockholm, announcing the delivery of the addresses and the hospitality with which he had been received at both places. It was resolved to

publish the addresses in the Society's 'Proceedings.'—The President read a letter received from Dr. Karl Jordan, F.E.S., asking the support of the Society for an International Congress of Entomology. A resolution, cordially approving the Congress, and offering the support and co-operation of the Society, was carried unanimously.—Dr. T. A. Chapman exhibited a living example of *Leioptilus carphodactylus*, Hb., one of the first bred British specimens which had emerged on June 2nd, from larvæ found by Mr. J. Ovenden.—Mr. H. St. J. Donisthorpe showed a specimen of *Microdon mutabilis*, with the empty pupa-case, bred from a larva taken in the nest of *Formica fusca* at Portlock, April, 1907; also males and females of *Kleditoma myrmecophila*, n. sp., bred last month from a nest of *Lasius fuliginosus* found at Wellington College in March, 1907. He said that this species of parasitic Cynipidæ, which was new to science, had been named by Professor Dr. J. J. Kieffer.—Mr. M. Jacoby brought for exhibition examples of small beetles, new to science, of the new genus Clythridæ, including *Leasia australis*, Jac.—Mr. A. J. Chitty exhibited the three types of the three species of Proctotrupidæ (*Gonatopus*), described by Westwood but entirely overlooked by subsequent authors.—Mr. E. E. Austen, F.Z.S., exhibited larvæ, pupæ, and imagines of *Cordylobia anthropophaga*, Grunb., a Muscid fly which is widely distributed in tropical and sub-tropical Africa, from Senegal to Natal, and in the larval stage is a subcutaneous parasite in man and certain other animals. Larvæ of various Muscidæ have frequently been found parasitic in human beings, but the parasitism is usually accidental; the larvæ of *C. anthropophaga*, however, like those of the Cæstridæ (Bot and Warble flies) appear to be normally parasitic. Much confusion as to the identity of this Muscid has been caused by its having been wrongly referred to by certain writers as *Bengalia depressa*, Walk., a totally different insect, which there is no reason to believe to be a parasite.—Professor E. B. Poulton, F.R.S., read a note "On the Significance of some Secondary Sexual Characters in Butterflies."—Dr. F. A. Dixey, M.A., M.D., and Dr. G. B. Longstaff, M.D., contributed a report of their joint entomological observations made in South Africa during the visit of the British Association in 1905, and gave a brief account of some of the points dealt with.—H. ROWLAND-BROWN, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 9th, 1907.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Goulton exhibited a long bred series of *Hybernia marginaria* (*progemmaria*) from Wimbledon.—Mr. Newman, a brood of living larvæ of *Aporia crategi*, from Kentish ova; they were nearly full-fed.—Mr. Kaye, living larvæ of *Oporina croceago*, from Gomshall.—Mr. Tonge, bred specimens of *Eupithecia consignata*, from Hayling Island.—Mr. Main, lantern-slides, showing the metamorphoses of *Charaxes jasius*.—Mr. Tonge, lantern-slides, showing the ova of various Lepidoptera and numerous instances of protective coloration.—Mr. Lucas, lantern-slides, showing rare plants.—Mr. Dennis, lantern-slides, showing varied aspects of trees.—HY. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1906-7. Pp. i-xvi, 1-106. Plates i.-iv. The Societies' Rooms, Hibernia Chambers, London Bridge.

The entomological papers in this excellent little publication, the issue of which is always awaited with considerable interest, are "A Few Notes on the Butterflies of Saskatchewan (Assiniboia)," by A. G. Croker and H. J. Turner, F.E.S., and "On the Occurrence of *Tortrix pronubana*, Hb., in Britain," by R. Adkin, F.E.S. Two of the plates are reproductions of photographs, by Messrs. G. T. Lyle and E. Step, of moths at rest on tree-trunks. The protective assimilation is admirable in both, but in Plate i., showing an example of *Xylina ornithopus*, the insect is, at first, more difficult to detect than is *Aplecta nebulosa* on Plate ii. Plate iii. shows a specimen of *Eupithecia consignata* at rest, and eggs—highly magnified—of the same species. These, together with greatly enlarged eggs of *Aporia crataegi* and *Pachetra leucophæa*, on Plate iv., are from photographs by Mr. A. E. Tonge.

In his address, the President, Mr. Robert Adkin, after dealing with the affairs of the Society, some books on Natural History published during the year, and recent additions to the British Fauna lists, concludes with some highly interesting remarks on the abundance of certain species of Lepidoptera in Britain during 1906, and the question of immigration in relation to such species and others.

OBITUARY.

WE have heard with regret that Mr. CHARLES J. WATKINS, of Watledge, Nailsworth, died May 27th, 1907, aged sixty years.

When quite young Mr. Watkins commenced to collect and study the British Lepidoptera, and this he continued to do throughout his life, although the other orders also received his attention. Side by side with entomology went the study of plant life, indispensable when a knowledge of the larval stage of insects became essential. Mr. Watkins thus was as keenly interested in the flora of the country as many botanists who confine themselves to this branch of natural science alone. Patient, methodical, and completely absorbed by the main business of his hours of leisure and relaxation, he accumulated a large collection of insects. He took great interest in directing youthful energy into what he considered profitable channels. In this way he formed a wide circle of friends, by no means confined to the immediate neighbourhood in which he lived. For many years he knew and worked with the late Mr. Merrin, of Gloucester. He gave valuable assistance in the preparation of 'The Fauna of Gloucestershire' by the late Mr. C. Witchell. Among articles from his pen may be mentioned "Denizens of an Old Cherry-tree." He was elected a Fellow of the Entomological Society of London in 1900.

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NOTES ON THE GENUS *EUPITHECIA*.

BY LOUIS B. PROUT, F.E.S.

I. BIBLIOGRAPHY AND SYNONYMY.

NOTWITHSTANDING the amount of good work that has been done at this fascinating genus, both by the past generation and the present, there is still room for much more, and especially there is need that what has been done should be more widely known. I do not pretend to have much to contribute which is original, but the notes—bibliographical, synonymic, and bionomic—which I have been accumulating for years have at least put me in a position to call the attention of those who will read the following to various English references which have been overlooked by German workers, and *vice versâ*.

To begin at the beginning. The generic name, *Eupithecia*, Curt., is *not* to be supplanted by *Tephroclystis*, Hb., as has been done by Meyrick and Staudinger-Rebel. Curtis published the genus *Eupithecia* (with type *linariata*, Schiff., Fb.) on April 1st, 1825; *Tephroclystis*, Hb. ('Verzeichniss,' p. 323) is now known not to have been published before August 27th of that year, more probably (as Hampson, Meyrick, and Aurivillius now accept, Proc. Int. Congress Zool., Cambridge, 1898, App. A., pp. 300, 302) not till 1827, or at earliest 1826. I advocated this retention of the name *Eupithecia* in the Trans. City Lond. Ent. Soc. x. 68, 1901, and the late Prof. Grote did so on somewhat different grounds* in the Allg. Zeit. Ent. vii. 470, in the following year.

Eucymatoge, Hb. (Verz. p. 325, type *togata*, Hb.), may provisionally be used, as advocated by Meyrick and others, for the few species with the areole double, but I have serious misgivings as to its proving a really natural genus, especially as there

* Grote assumes the date of both to be 1825, and the actual priority to be undeterminable, and therefore follows the recommendation of the German Zoological Society's Code in preferring the name which had a type specified.

is evidence that this character is variable in certain "pugs" (cf. Dietze and Bastelberger, 'Iris,' xiv. 140-1); in any case, the dissonant element incorporated by Meyrick (*tersata*, *vitalbata*, and allies) must be removed on larval and other characters, and form part of the genus *Cœnocalpe* = *Phibalapteryx*. The British "pugs" which belong to *Eucymatoge*, according to Meyrick, are *togata*, *subnotata*, and *scabiosata*, and it needs a little faith to unite these, while isolating them from the rest, on larval characters; perhaps *togata* alone would make a better genus.

Chloroclystis, Hb. (Verz. p. 323, type *coronata*, Hb.) seems a valid genus, is accepted by Staudinger, and ought to be used in Britain for our three green species. The same remarks apply to *Gymnoscelis*, Mab., for *pumilata*, except that this has not been accepted by Staudinger. It is interesting to observe that Mr. F. N. Pierce, of Liverpool, who is examining the genitalia of the group, considers the harpes of *Gymnoscelis pumilata* to constitute it a group by itself, and also places *Chloroclystis* as separate from the main groups.

As regards the synonymy of the species, some corrections which have been made by Dietze, Bohatsch, and others on the Continent, and accepted in Staudinger's new edition, have not yet been introduced into any authoritative British list; whilst certain other necessary corrections have been made still more recently, or will be here made public for the first time. In this connection I shall include also several bibliographical emendations which have escaped the notice of our German *confrères*, especially concerning our early British work at the genus. We English have been the worst of bibliographers, and I am really not surprised that at least four species, perhaps more, have not their original description cited in Staudinger's 'Catalog,' while some varietal names have been entirely overlooked. I shall not separate the British references from the non-British, but shall take the species in the sequence in which they occur in Staudinger.

Eupithecia ræderaria, Stndf. (1888).—Dietze has discovered that an older name applies here, namely, *liguriata*, Mill. (1884)—cited with a query as synonym of *distinctaria*, H.-S., Stgr.-Rebel, pt. ii. p. 256.

Eupithecia abietaria, Goeze.—Dietze has shown ('Iris,' xiv. 139) that this name really applies to *togata*, Hb., not to *strobilata*, Hb., ?Bkh., to which it has long been referred. German entomologists are now using *abietaria* in the corrected sense, but fortunately the familiar name of *togata* really stands unimpaired. *Phalæna Geometra abietaria*, Goeze, 1781, was a homonym, invalidated by *Geometra abietaria*, Schiff., 1776 (= *ribeata*, Cl.), and the first valid name imposed was Hübner's.

Eupithecia insigniata, Hb.—Hübner's name (Beitr. ii. pt. iv. p. 97) is at least two years older than Borkhausen's *consignata*,

which is still used in Britain. Sherborn's 'Index Animalium' gives the date of *insignata* as 1790, according to the title-page of vol. ii., but Staudinger is more likely right in giving 1792. Vol. i. of the 'Beiträge,' in four parts, was published in 1786, 87, 88, 89, and it is unlikely that vol. ii., also in four parts, was completed in a single year, although its preface (dated 24th November, 1790) expresses a hope that this may be possible.

Eupithecia venosata, Fb.—I have already pointed out (Entom. xxxvii. 152) that the correct varietal names of the Shetland and Orkney forms are respectively var. *fumosæ*, Gregs. (= *nubilata*, Bhtsch.), and var. *ochracæ*, Gregs. (= *orcadensis*, Prout), and I have nothing further to add on these. I shall be grateful if any reader of these notes can furnish me with the original reference for var. *fumosæ*, as the earliest which I have obtained ('Young Naturalist,' viii. 111) does not give the impression of an original description, but at the same time I have sought in vain for an older one in the pages of the 'Young Naturalist.' Gregson also gave the name of var. *bandanæ* ('Young Naturalist,' viii. 111) to the more variegated banded Shetland forms, with the white striae well marked, and the ground colour darkened between them. The "? var. *schiefereri*, Bhtsch.," of Staudinger's 'Catalog,' is, according to Bohatsch and Dietze, a valid species; *cæruleata*, Favre (Fn. Valais, p. 305), is a synonym (*vide* Mitt. Schweiz. Ent. Ges. x. 361).

Eupithecia distinctaria, H.-S. — British entomologists have continued erroneously to call this species by its younger name of *constrictata*, Gn. The latter name first appears in a note by Doubleday in 'The Zoologist' for 1856, pp. 5140, 5141, but as no description was given it must be reckoned a *nomen nudum* until Guenée's work appeared in January to February, 1858 (not in 1857, as is invariably quoted from the title-pages).

Eupithecia expallidata, Dbld., and *E. assimilata*, Dbld.—These are usually attributed to Guenée (1858), but both were named and adequately described by Doubleday in 1856 (*vide* Zool. xiv. pp. 5140 and 5142).

Eupithecia goossensiata, Mab., = *minutata*, Dbld., Gn., nec Hb.—The reference to Guenée in Staudinger's 'Catalog' should be preceded by "Dbld., Zool. 1856, p. 5140," but the name *minutata*, Schiff., properly belongs to *absinthiata*, and its later reference to the heath-feeding species is an error. If the name *callunæ*, Speyer (1867), is really referable to the same form, this is older than *goossensiata*, Mab. (1869), but there is still some doubt (*vide* Ent. Rec. xiii. 324).

Eupithecia denotata, Hb.—It is now perfectly well known that this name, unfortunately, supersedes the suitable one of *campanulata*, H.-S. There is some ground, however, for believing that it is not quite so absolutely confined to *Campanula* as we have been inclined to suppose. I shall return to this presently.

Eupithecia vulgata, Haw.—There seems very little doubt that Hübner's figure of *austerata* is really meant for this species, and that his name ought to supplant Haworth's.

Eupithecia virgaureata, Dbld.—The original reference to this name has been quite lost sight of, and it is generally stated to originate in Newman's 'British Moths.' But it was validly published several years earlier, namely, in 'The Zoologist' for 1861, p. 7566. This is fortunate, as it will just save the familiar and appropriate name. It will be noticed that *altenaria*, Stgr., also dates ostensibly from 1861,* and is given as a var. of *virgaureata* in Stgr. Cat. (one of several cases of "the cart before the horse," if his dates were correct). I am, however, by no means satisfied that *altenaria* is co-specific with *virgaureata*, and regard the question as an open one.

Eupithecia cauchiata, Dup. (not *cauchyata*, as spelt by Staudinger and Meyrick).—This species has never, to my knowledge, been taken in Britain; the name has crept into Meyrick's 'Handbook' through a misidentification of Guenée's *pernotata*. This latter, according to the type-specimens, Staudinger declares to be an obscurely marked *satyrata* (ab. *subatrata*, Stgr., which should hence be known as ab. *pernotata*, Gn.). In any case, Doubleday's unique British "*pernotata*" is, as Barrett correctly determined, an aberration of this variable species (*satyrata*, Hb.).

Eupithecia haworthiata, Dbld. (Zool. 1856, pp. 5139, 5141), Sttn. (Man.).—Here, again, the origin of the name has been overlooked, and it has been attributed to Stainton's 'Manual.' The name of *isogrammaria*, H.-S., rested on an error of determination, and must be dropped; *isogrammaria*, Tr., was *plumbeolata*, Haw.

Eupithecia tenuiata, Hb.—Gregson erected a var. *cineræ* from Morayshire ('Young Naturalist,' ix. 104, 1888), which might be diagnosed as "major, cinerascens, vix strigata."

Eupithecia inturbata, Hb. = *subciliata*, Dbld.—The name *subciliata* first appeared in Doubleday's 1856 article on the genus (Zool. xiv. pp. 5140, 5143), but even so it is far subsequent to *inturbata*, Hb., which has been rightly revived on the Continent (cf. Speyer in Stett. Ent. Zeit. xlii. 473; xlv. 94).

Eupithecia fraxinata, Crewe.—The original account of this was, I think, published almost simultaneously in two places—Week. Ent. i. p. 134 (6th December, 1862), and Ent. Annual (? December, 1862). The question is of little importance, as the same name is used in both.

Eupithecia dodoneata, Gn.—This name was mentioned by Doubleday in 'The Zoologist' for 1856, before Guenée published it; but it was only a *nomen nudum*, therefore of no standing.

* The date of p. 7566 of 'The Zoologist' was about June, 1861; *altenaria* appears in the Stett. Ent. Zeit. for October-December, 1861 (p. 401), hence probably published at the beginning of 1862.

Eupithecia sobrinata, Hb. — The Dover var. (or bon. sp. ?), which is usually spoken of as *stevensata*, Webb (a name never satisfactorily published), was named *anglicata* by Herrich-Schaeffer in 1863 (C. B. Zool.-min. Ver. Regensb. xvii. 23), and must so stand in future lists. The interesting occurrence of a perfect specimen at Freshwater (Entom. xxxviii. 161) seems conclusively to point to some other food-plant than juniper. According to Venables' 'Guide to the Isle of Wight' (p. 483), Brading Down, many miles from Freshwater, "boasts of the single shrub of juniper yet found in the Isle of Wight, and it, like the yew its neighbour, may have been planted."

II. SUCCENTURIATA, INNOTATA, AND ALLIES.

There are one or two other questions of the possible specific identity of pairs of allies which have not yet been adequately discussed; and, again, a few other perennial questions of the same kind, which it seems in vain to answer unless workers will take more pains than at present to acquaint themselves with the existent literature.

In this latter category I would place the *succenturiata-subfulvata* question, although I do not wish to be dogmatic, or to ignore the statement of Heylaerts (Tijd. Ent. xvi. 146) that he once took the two forms *in cop*. The subject has recently been reopened in this country by my friend Mr. E. M. Dadd (Ent. Rec. xviii. 261), who treats the species named as a "puzzling group" which still wants clearing up. He depends chiefly on the experience of Herr Herz, who on one occasion bred both species from larvæ beaten from yarrow, and could not, or did not, sort out his larvæ; also on the testimony of the eminent specialist, Herr Dietze, which, however, seems only to have reached him second-hand. Dietze published a fine plate of the various forms, with notes thereon, in the 'Iris' of 1906 (vol. xix. pl. iv. pp. 121-126), and treats all as making one variable species. In the text occurs this very definite statement: "That these are a single species is no longer mere conjecture, but has been demonstrated by anatomical investigation." He does not adduce the evidence, the article being mainly concerned with the variations figured, which are considered to show pretty complete gradations, though, to my eyes, the darkest *succenturiata* (ab. *disparata*, fig. 7), with the white persisting below the discal dot, is entirely different from the lightest forms of *subfulvata* (figs. 19 and 21), with at least a tinge of rust-colour in that position. I wrote to the author, pointing out that in Britain the two were abundantly distinct species, and had been differentiated as larvæ and pupæ, as well as imagines, and asking for further particulars of the biological evidence on which he relied. I received a very courteous reply, in which he informed me that Herr Petersen, of Reval, had found the male genitalia indistinguishable, and that his own long

experience of the larvæ had shown him no structural difference, while the coloration of *succenturiata* larvæ changed entirely when the food-plant was changed from *Artemisia* or *Tanacetum* to flowers of *Achillea*. He added that Dr. Draudt's careful work at the eggs (*vide* 'Iris,' xviii. 308) had also failed to educe any differential characters, although that author found more individual variation in both than in any other species of the genus. I may remark here that Mr. J. Gardner, of Hartlepool, admits that "in beaten larvæ I certainly would not undertake to say whether they were those of *E. succenturiata* or *E. subfulvata*," although his experience satisfies him that they are two species (*Ent. Rec.* xix. 24). Herr Dietze recognizes (in the letter just



SUCCENTURIATA.



SUBFULVATA.

referred to) a pupal difference, but remarks that a similar variation in the colour of the wing-cases occurs in *E. absinthiata*. As regards the genitalia, however, my old friend and colleague, Mr. F. N. Pierce, is entitled to have his say, as he is such an authority on this particular study. Although he freely admits that the differences are very slight, he is able to venture a fairly definite statement (*in litt.*, 29th January, 1907), as follows:—"I examined *subfulvata* and *succenturiata* many years ago, and only last night, now that I know the parts better, am I able to say definitely there is a difference. I enclose a rough sketch of the largest of the three teeth processes,* and am also sending for

* This sketch is reproduced in the accompanying cuts, by Mr. Pierce's permission.

you to see the preparations, from which I think you will see there is a difference in all three [processes], but most noticeable in the largest one." I forwarded the "rough sketch" to Herr Dietze, and he agrees that it shows a difference which, if constant, should be specific. I need not here refer to the work done by Crewe and Hellins nearly half a century ago (Zool. 1861, pp. 7796, 7797; Ent. Ann. 1861, p. 130; 1862, pp. 42-44; 1863, p. 126, &c.), except to recommend it to the notice of our Continental friends; for we in Britain have been, more or less, familiarized with it through Newman's, Buckler's, and other books. Much more recently (1895-96) a number of interesting notes appeared on the subject in vol. ii. of the 'Entomologist's Record' (pp. 43, 83, 87, 109, 197, 254), which brought out that, although the food-plants are not always different—mugwort, tansy, and yarrow suiting both species*—every other circumstance favours the absolute distinctness of the two. I would especially emphasize Mr. Sheldon's observations (pp. 197-198), including the pupal differentiation; the pupa of *subfulvata*, from an experience of thousands of examples, is shown to be rich red, with the wing-cases somewhat lighter and inclined towards buff; while that of *succenturiata* has the abdomen dark buff, inclined towards brown, and the wing-cases of a decided olive-green.

(To be continued.)

LIFE-HISTORY OF *CHRYSOPHANUS DISPAR* VAR. *RUTILUS*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

(Concluded from p. 146.)

BEFORE first moult the larva measures $\frac{1}{9}$ in. long, of a pale semi-transparent yellowish green. They continually shift their quarters, never remaining to feed in the same place long. The first moult took place on June 26th, the first stage lasting only five days.

Before second moult it is $\frac{3}{14}$ in. long. The whole formation is similar to the first stage; the segments are boldly humped dorsally, the sides flattened and sloping, the body being somewhat depressed; the dorsal surface forms a gentle curve from one end to the other, the ventral surface is flattened. The dorsal hairs, which are now more numerous, are much stouter and

* Readers who possess a copy of Barrett's 'British Lepidoptera' should make a small correction in vol. ix. p. 53. I did not tell Mr. Barrett that *E. subfulvata* fed willingly on the blossoms of the garden chrysanthemum, but on the leaves; *E. succenturiata* can also be reared on chrysanthemum-leaves.

shorter in proportion; they are pale with brown tips, and the base of each is amber-brown; several minute hairs are dotted over the side, about ten on each segment on either side; all the hairs are serrated. The spiracles are rather prominent and brown; behind each spiracle are two pale false spiracles, only slightly darker than the ground colour. The head is very pale greenish yellow, with black eye-spots and brown mouth-parts; the entire body, including the legs and claspers, is of a pale green, and the whole surface finely cellular. They feed chiefly on the under side of the leaves, and when moulting usually lie along or quite near the midrib.

Second moult, July 2nd, the second stage also lasting five days.

Before third moult it measures $\frac{3}{8}$ in. long, similar to previous stage in general structure excepting several additional hairs, and it is studded with white clubbed processes resembling frosted glass. The colour is a clear light green, with slightly darker green medio-dorsal and lateral longitudinal lines and oblique side stripes. The head is shining pale ochreous-green, eye-spots black, and mouth-parts brown. In this stage they perforate the leaf, eating large holes all over it.

Third moult and last, 7th July, the third stage also occupying only five days.

After third moult, fully grown, it measures from $\frac{3}{4}$ in. to $1\frac{1}{16}$ in. long. The dorsal surface forms a complete curve from the first to last segment, and has no longitudinal dorsal furrow; the sides are sloping to the lateral ridge; the ventral surface is much flattened, overlapping the claspers and legs, completely hiding them; both the anterior and posterior segments are rounded and projecting, the former quite concealing the head, which is withdrawn into the segment while at rest; the body is widest at the fifth segment, the head is rather small, shining, and of a very pale ochreous greenish; eye-spots black, mouth-parts brown; the segments slightly humped dorsally; the segmental divisions inconspicuously defined. The whole colouring is a clear brilliant green, with slightly darker markings showing in certain lights, of which the oblique side stripes and dorsal lines are the plainest; the spiracles are outlined with rust-brown. The entire surface is sprinkled with tiny pure white knobs on short stalks, resembling rough frosted glass formed almost exactly like young unexpanded mushrooms; also short spinous serrated hairs are densely strewn over the whole surface, the longest cover the dorsal and lateral regions, most have the apical half brownish, but many are extremely small and indistinct, being wholly green like the body. The surface is finely granulated, of a cellular pattern, the legs and claspers are closely united, being placed almost touching at the base of each pair, occupying a medio-ventral line. They are sluggish in their

movements, crawling with a slow gliding motion, but eat voraciously, and grow rapidly.

The first one pupated on July 12th, again occupying five days in the last larval stage. In each stage the first one was rapidly followed by the greater part of the large number I had under observation, so that the dates given apply to the majority. The larval state occupies only twenty-one days.

Directly after pupation the colour is ochreous yellow, changing through greenish, and the markings gradually deepening. All the markings are clearly defined in ninety minutes after pupating; in twenty-four hours the colouring and markings are perfected.

The pupa measures in length from $\frac{7}{16}$ to $\frac{1}{2}$ in., and $\frac{1}{4}$ in. in width; it is stout, dumpy, and rounded. Side view: the head is slightly angular, due to the ridge in front; thorax convex; abdomen forms a complete curve to the anal extremity, which is ventrally much compressed, and clothed with cremastral hooks; the ventral surface forms almost a straight line. Dorsal view: head rounded, swollen across the thorax, concaved in the middle; abdominal segments swollen and rounded, widest at the third and fourth segments; anal extremity bluntly attenuated. Colouring of head, thorax, and wings pale ochreous; a dusky brown medio-dorsal longitudinal line; abdomen pale ochreous-brown dorsally, oblique yellow ochreous stripes bordered below by a dark brown band spotted with buffish white, two to three spots on each segment; rest olive-brown, blending into ochreous at the extremity; spiracles prominent and whitish; thorax speckled subdorsally with olive-brown. The whole of the head, thorax, and abdomen sprinkled with minute whitish floral vase-like processes, expanding into clefted petal-like formations surrounding the mouth of the vase; also the surface is covered with tiny circular discs, and raised dark brown and black reticulations of an irregular network pattern; also on the head are numerous minute white hairs with branching tips—the whole forming a wonderfully elaborated decorative surface. Before emergence the entire colouring deepens until the final coloration of the imago shows through the shell. It is firmly attached to a stem of the plant or under surface of the leaf by a girdle round the middle, and the cremastral hooks securely anchored to a pad of silk spun on the surface.

The first (a male) emerged July 23rd, 1906, followed by a large number of both sexes daily, until the end of the month. About an equal proportion of sexes emerged.

During the middle of August I received living females from Colmar, which deposited freely upon dock and sorrel. The eggs hatched at the end of August and beginning of September. They fed and grew much slower than the summer broods. During September they moulted once, and entered into hibernation in

the beginning of October. In December I examined the two plants upon which they hybernated, and found all those upon the living plant of dock (with plenty of green leaves) were dead, while a large number of those upon the plant that had died down with only brown shrivelled leaves were alive and apparently healthy, hybernating in the folds of the damp dead leaves. Before hybernating the larva gradually changes to a more or less lilac hue, which chiefly forms broad medio-dorsal, subdorsal, and lateral longitudinal bands, which are separated by more or less greenish stripes.

This remarkable change of colour from pure green (a colouring retained unchanged throughout its existence in summer) is an instance of wonderful adaptation of protective colouring assumed entirely to harmonise with its surroundings while hybernating; the dull lilac and greenish produce a most protective combination of colour, and render the larva very inconspicuous on the dead leaves. After hybernation and before the second moult they gradually lose the lilac colouring, and assume the normal green.

On February 27th, 1907, I examined the plant, and noticed several alive; some were crawling actively about, and a few were on the under side of the young freshly grown leaves, while others were still hybernating in the folds of the dead leaves.

Among the large number of specimens bred during last summer great variation exists on the upper side of the females; some have the coppery orange colouring suffused over the secondaries, with only faint dusky linear markings between the nervures, these wings appearing unicolorous with the primaries, and the latter with small dusky spots; others have secondaries of a uniform brownish black to the marginal coppery band, and with large spots on the primaries. Every gradation occurs between these two forms in the series bred, including the interesting gynandrous specimen figured on p. 145, which appears a very complete example of gynandromorphism, even as far as the antennæ and genitalia; also the partial coloration of the abdomen.

Upon microscopical examination I find the pupa of var. *rutilus* identical in structure in every detail to that of *dispar*, excepting the specimen measured of the latter is a trifle larger, measuring $\frac{9}{16}$ in. in length. From the descriptions published (which are vague) of the larvæ of *dispar*, they agree with that of *rutilus*. Although I believe many entomologists still consider *dispar* a distinct species, there is not the slightest doubt that the latter is merely an isolated localized form, due to climatic conditions.

ON THE BRACONIDOUS CRYPTOGASTRES.

BY CLAUDE MORLEY, F.E.S., &c.

THE Cryptogastres form a small and natural group in the family Braconidæ, and are so often bred out of lepidopterous larvæ that perhaps a succinct account of them may not be out of place. I was led to look through the specimens in my collection by the great number of individuals which were on the wing during last year, and, as some of these appear of unusual occurrence, I have added a few notes on their habitats and time of appearance. The group, as a whole, may be at once recognized from all the other Parasitica by the dorsum of the abdomen—appropriately termed the “carapace” by Marshall—being composed of but a single piece through the fusion of the three basal segments, though occasionally the sutures are more or less visible, always, however, connate and firmly soldered together, and never with a flexible connecting membrane, as in the Ichneumonidæ. They are all dull and rugose insects, usually black, though sometimes more or less testaceous or fulvous. I shall be very thankful at all times for bred hymenopterous parasites.

The six British genera may be thus distinguished:—

- | | | |
|------|---|---------------|
| (8) | 1. Wings clouded; abdomen elongate (Chelonidæ). | |
| (5) | 2. Abdomen dorsally trisegmented. | |
| (4) | 3. Intermediate tibiæ strongly sinuate externally | PHANEROTOMA. |
| (3) | 4. Intermediate tibiæ straight | SPHÆROPTERYX. |
| (2) | 5. Abdomen dorsally entire. | |
| (7) | 6. First cubital cell of upper wing entire | CHELONUS. |
| (6) | 7. First cubital cell bisected by a nervure | ASCOGASTER. |
| (1) | 8. Wings hyaline; abdomen subovate (Sigalphidæ). | |
| (10) | 9. Second segment longer than third, two follow-
ing visible | ALLODERUS. |
| (9) | 10. Second segment shorter than third, remainder
concealed | SIGALPHUS. |

The usual distinctions between these two families seem to me too slight to be retained; from the Chelonidæ, the Sigalphidæ is known by having three instead of two cubital cells (which does not hold in *Ascogaster*), and the reflection of the ventral borders and length of the concavity cannot be seen in carded specimens. *Phanerotoma* and *Sphæropteryx* I have not met with, and but a single species of each—*P. dentata*, Panz.,* and *S. irrorator*, Fab.—occurs in Britain. Marshall gives a somewhat unsatisfactory table of the European Cheloni—or, I should perhaps say, treats them unsatisfactorily, since there is no table. He first presents

* Since this was written I find that I swept a single *Phanerotoma dentata* in Tuddenham Fen, Suffolk, on 27th August, 1906.

all the males and females which will work in together, and then goes on with those males which will not so accommodate themselves, ending with both sexes of *Ascogaster*, as forming a distinct division of the same genus, from which the central nervure bisecting the cubital cell forms a much better character than is often obtainable for superficially very distinct genera, e. g. *Ascogaster* and *Sigalphus*.

CHELONUS, Jur.

- (32) 1. Tegulæ infusate or black.
- (19) 2. Antennæ of female more than 16-jointed; male anus entire.
- (4) 3. Abdomen mainly red 1. *westmæli*, Curt.
- (3) 4. Abdomen black or only basally pale.
- (16) 5. Radius apically arcuate, and, in lower wing, centrally curved.
- (11) 6. Hind tibiæ basally, and base of their tarsi, red; length, 5-6 mm.
- (10) 7. Parastigma infusate; frontal impression rugulose.
- (9) 8. Antennæ centrally dilated and apically constricted 2. *inanitus*, Linn.
- (8) 9. Antennæ setiform throughout 3. *submuticus*, Wesm.
- (7) 10. Parastigma testaceous; frontal impression nitidulous 4. *speculator*, Msh.
- (6) 11. Hind tibiæ basally, and their tarsi entirely, black; length, 3-4 mm.
- (13) 12. Frontal impression rugose and not carinate 5. *corvulus*, Marsh.
- (12) 13. Frontal impression nitidulous and centrally carinate.
- (15) 14. Abdomen immaculate; hind tibiæ broadly red centrally 6. *carbonator*, Msh.
- (14) 15. Abdomen basally flavous; tibiæ narrowly red centrally 7. *decorus*, Marsh.
- (5) 16. Radius straight, and, in lower wing, basally curved and nearly straight centrally.
- (18) 17. Antennæ 32-jointed, longer than body; size, 3 mm. 8. *catulus*, Marsh.
- (17) 18. Antennæ 23-jointed, not longer than body; size, $2\frac{1}{2}$ mm. 9. *pusio*, Marsh.
- (2) 19. Antennæ of female 16-jointed; male anus apically cleft.
- (21) 20. Anal cleft nine times longer than broad 10. *risorius*, Reinh.
- (20) 21. Anal cleft at most thrice longer than broad.
- (31) 22. Abdomen black; size at least 2 mm.
- (26) 23. Head cubical and cheeks buccate.
- (25) 24. Prothorax elongate; antennæ 25-jointed 11. *secutor*, Marsh.
- (24) 25. Prothorax normal; antennæ of male 23-jointed 12. *exilis*, Marsh.

- (23) 26. Head transverse and cheeks normal.
 (28) 27. Femora of female entirely testaceous; male cleft, elongate 13. *latrunculus*, Msh.
 (27) 28. Femora mainly black; male cleft, transverse.
 (30) 29. Anus of female emarginate below; male antennæ at least 27-jointed 14. *parvicornis*, H.-S.
 (29) 30. Anus of female entire; male antennæ at most 25-jointed 15. *sulcatus*, Nees.
 (22) 31. Abdomen basally flavous; size, $1\frac{1}{2}$ mm. 16. *basalis*, Curt.
 (1) 32. Tegulæ testaceous.
 (34) 33. Face of male obsoletely pubescent; female antennæ 16-jointed 17. *dispar*, Marsh.
 (33) 34. Face of male densely pubescent; female antennæ 18-jointed 18. *canescens*, Wesm.

Chelonus inanitus.—The most abundant species of the whole group, occurring in meadows and marshy situations everywhere from 11th June to 12th September, but very rarely bred. I have but once bred it, and then from an unknown host, at Lowestoft. It is commonly swept from reeds, oats, &c., and frequents the flowers of angelica, heracleum, thistles, fennel, carrot, meadow-sweet, mallow, and *Limonium statice*. There are ninety-six specimens in my collection, taken at Parknasilla, in Ireland (Yerbury); Shere, in Surrey (Capron); Felden, in Herts (Piffard); Totland Bay, in Isle of Wight (Newbery); Tostock, Benacre Broad, and Southwold, in Suffolk (Tuck); West Runton, in Norfolk (Wainwright); Abinger Hammer, near Guildford (Butler); Oulton Broad (Bedwell); New Forest (Miss Chawner); Rye, in Sussex (Donisthorpe); Reigate, Greenings, &c., in Surrey (Wilson Saunders); Hastings district (Bloomfield); Epsom, Ryde, and Lyndhurst; Ringstead, Holme, and Burnham Thorpe, in Norfolk; and in Suffolk at Henstead, Claydon, Blakenham, Baylham, Alderton, Foxhall, Barnby Broad, Southwold, Monks Soham, Burgh, Peasenhall, Farnham, Dunwich, Barham, Clopton, Bealings, Grundisburgh, and Bramford.

C. speculator.—Mr. Albert Piffard has given me a female, which he took at Felden, in Herts.

C. corvulus.—Certainly uncommon. I possess it from Greenings, in Surrey, one in June, 1871 (W. Saunders); Felden, in Herts, two (Piffard); and Brighton, where I took a male on umbelliferous flowers, 28th June, 1897.

C. carbonator.—Somewhat common; I have thirteen specimens. Piffard found several females at Felden, in Herts, and I swept the males commonly from *Limonium statice* at Holme, in Norfolk, in August, 1906; W. Saunders took a male at Reigate in July, 1872; and others have occurred to me in Suffolk, at Bamford, Foxhall, Blythborough (beneath growing dock-leaves), and Westleton (by sweeping), and upon angelica and other flowers, from 8th July to 5th September.

C. secutor.—I swept one male in a marsh by the river at Brandon, in Suffolk, 25th August, 1906.

C. latrunculus.—My four examples were captured by Dr. Capron at Shere, and Mr. Piffard at Felden.

C. sulcatus.—The commonest of the small species, usually occurring in marshy situations. Harting, 11th September, 1899 (Beaumont); Greenings and Reigate (W. Saunders); Felden, in Herts (Piffard). I have found it from 8th June to 9th September at Claydon, Brandon, and Barton Mills, in Suffolk, by sweeping, and at the roots of *Senecio jacobæa*. Mr. E. R. Bankes bred five specimens from *Asychna æratella*, Zell., at Shoreham, Sussex, June 17th to 23rd, 1895.

C. dispar.—The only specimen I have seen is a male, which was running swiftly among moss at Foxhall, near Ipswich, 13th September, 1903.

ASCOGASTER, Wesm.

- (10) 1. Trochanters mainly red.
- (3) 2. Clypeus apically truncate and centrally mucronate
1. *instabilis*, Wesm.
- (2) 3. Clypeus apically rounded or emarginate.
- (7) 4. Hind tibiæ basally black.
- (6) 5. Hind tibiæ white-banded centrally 2. *annularis*, Nees.
- (5) 6. Hind tibiæ not white-banded 3. *ratzeburgi*, Marsh.
- (4) 7. Hind tibiæ basally red.
- (9) 8. Clypeus apically subbidentate; hind tarsi basally
white 4. *rufipes*, Nees.
- (8) 9. Clypeus apically emarginate; tarsi basally {
ferruginous { 5. *rufidens*, Wesm.
6. *canifrons*, Wesm.
- (1) 10. Trochanters black.
- (14) 11. Mesonotum distinctly punctate.
- (13) 12. Clypeus apically mutic 7. *variipes*, Wesm.
- (12) 13. Clypeus apically bidenticulate 8. *bicarinatus*, H.-S.
- (11) 14. Mesonotum rugosely reticulate.
- (16) 15. Abdomen only basally testaceous 9. *elegans*, Nees.
- (15) 16. Abdomen not, or mainly, fulvous.
- (18) 17. Frontal impression deep and laterally bordered
10. *armatus*, Wesm.
- (17) 18. Frontal impression shallow and not bordered
11. *quadridentatus*, Wesm.

Acrogaster instabilis.—Widely distributed. I possess several taken at Felden by Piffard; and single specimens at Ravenscraig, on 17th June, 1899, by Dalglish; and at Greenings, in Surrey, in June, 1871, by W. Saunders.

A. annularis.—I have only seen one male, captured by Mr. E. A. Newbery in his house at Dartmouth Park, London, and thought by him to be probably parasitic on clothes-moths (it has been bred from *Ecophora lambdella* in Devon).

A. rufipes.—Rev. C. D. Ash gave me one in June, 1902, which he had just bred from Aberdeenshire *Euchromia flammeana*;

Piffard took several from Felden, in Herts; and I swept, on 28th August, 1906, a specimen in Tuddenham Fen, Suffolk.

A. rufidens.—A common species, taken by Dalglish at Irvine and Bishopton in July; by Piffard at Felden; by Rev. E. N. Bloomfield at Guestling, in Sussex, in 1877; and by myself on umbelliferous flowers at Bildeston, in Suffolk, 30th July, 1898. This species has the clypeus apically tridentate, and not, as in *A. canifrons*, obsoletely unidentate centrally.

A. variipes.—Not uncommon in damp spots. I took it in Wicken Fen, Cambridgeshire, 8th June, 1902; in Henstead marshes, Suffolk, by sweeping, 3rd July, 1906; and possess others from Felden, in Herts.

A. armatus.—A rare and conspicuous species, of which I have only seen two examples, both taken in August; one at Reigate in 1872 by Wilson Saunders, and the other by myself in Mr. Adams's garden at Lyndhurst, on 8th, 1901.

A. quadridentatus.—Very common. Mr. E. R. Bankes has thrice bred it: nine specimens emerged at Corfe Castle, Dorset, between June 20th and July 4th, 1901, from larvæ of *Sericoris bifasciana*; one emerged in the same locality on June 26th, 1901, from (probably) *Acrolepia granitella*; and between May 4th and 25th, 1900, sixteen were bred from larvæ of *Lozopera francillonana*, in stems of *Ferula communis* collected at Ile St. Marguerite, Cannes, by Chapman the preceding spring. I have thrice received it from Dr. Chapman. On the first occasion (1st June, 1900) about twenty were bred, with a single male of *Bracon pectoralis*, Wesm., from *Lozopera francillonana* at Cannes; secondly (29th April, 1900), one emerged from the larval case of *Psyche tenella* var. *zermattensis* at Locarno or Cannes in March or April; thirdly (2nd May, 1900), one was bred at Cannes from the first-named host; and, lastly (17th May, 1901), a single specimen emerged from a larva of both *Lozopera deaurana* and of *L. francillonana*. Tuck has captured it at Tostock, in Suffolk, 20th July, 1900; I have found it on umbelliferous flowers at Grundisburgh on 25th July, 1898, and swept it in Bentley Woods, 15th June, 1895; Wilson Saunders found it at Greenings, in Surrey, in June, 1871; and Col. Yerbury, at Nairn, on 7th June, 1904.

I have not met with the only British species of *Alloderus*—*lepidus*, Hal.—which may be known from the three other palæarctic species by its rugose third segment, which is not centrally carinate, and by the antennæ being at least 29-jointed, with the terebra as long as the abdomen.

SIGALPHUS, Latr.

Head and thorax red	1. <i>thoracicus</i> , Curt.
Head and thorax black.	
Frons with inter-antennal tooth; abdominal sutures	
obsolete	2. <i>ambiguus</i> , Nees.

Frons mutic ; abdominal sutures distinct.

Second suture subobsolete ; legs clear red 3. *pallidipes*, Nees.

Second suture distinct.

Femora testaceous, rarely black-rayed.

Antennæ 29-jointed ; terebra as long as body

4. *caledonicus*, Marsh.

Antennæ at most 26-jointed ; terebra shorter than body

5. *luteipes*, Thoms.

Femora black, rarely apically red.

Antennæ at least 27-jointed ; length, 3 mm. 6. *striatulus*, Nees.

Antennæ at most 25-jointed ; length, 1 to 2 mm.

Terebra longer than body 7. *caudatus*, Nees.

Terebra much shorter than body.

Abdomen broadest at the not apically striate third segment

8. *floricola*, Wesm.

Abdomen broadest beyond the entirely striate third segment

9. *obscurellus*, Nees.

Only four species are known to me, but they are all about equally common :—

Sigalphus luteipes.—Taken by Mr. Tuck at Benacre Broad and Aldeburgh, in Suffolk, in August and September ; and by myself by sweeping at Bramford, and on angelica flowers at Kenton. in the some county ; and at Ryde, in the Isle of Wight.

S. caudatus.—Felden, in Herts (Piffard) ; Kilmore, in August (Beaumont) ; Greenings, in Surrey, July, 1872 (W. Saunders) ; Aldeburgh, in September (Tuck) ; Needham, Ipswich, and Claydon, in Suffolk.

S. floricola.—I have swept this species from reeds at Southwold, on the Suffolk coast, 28th September, 1900 ; Piffard has found it at Felden ; and Donisthorpe has bred it from the weevil, *Ceuthorrhynchus sulcicollis* (cf. Trans. Ent. Soc. 1907).

S. obscurellus.—Blackheath, in July and August, 1899 (Beaumont) ; Reigate, in July, 1872 (W. Saunders) ; Aldeburgh, in September, 1899 (Tuck).

Monks Soham House, Suffolk :
2nd May, 1907.

A BIBLIOGRAPHICAL NOTE ON SOME JAVANESE SACCHARICOLOUS THYSANOPTERA.

By G. W. KIRKALDY.

IN 1890 W. Krüger described* *Thrips sacchari* and *Phlæothrips lucassenii*. Two years later J. D. Kobus described *T. serrata*, *binervis*, and *striatoptera*,† and in 1898 Kobus reprinted his

* "Ber. Versuchst. West-Java," Hefte 1 and 2. † "Med. Proefst. Oost-Java," No. 43. Both these probably published in the 'Archief voor Suiker-industrie,' 1890 and 1892 respectively.

paper.* In 1899 Krüger rediscussed these species,† including also some described by Zehntner in 1897. These papers are not reported by the 'Zoological Record,' or (apparently) by the 'Bericht der Entomologie,' and the species were not included by Uzel in his monograph.

NOTES AND OBSERVATIONS.

NOTE ON THE DISPERSAL OF BUTTERFLIES.—I was interested, when on the north-west coast of Madagascar, to have presented to me on the same day—May 26th, 1907—an instance both of the natural and what I may call the artificial means by which butterflies are dispersed. Regarding the latter, when the ship was loading some highly odoriferous hides in Majunga harbour, about six specimens of *Crenis madagascariensis*, Boisd. persisted in flying about the ship, regardless of the crowd of passengers, the noise of winches, and general turmoil and confusion. They also flew down the hatchway through which the cargo was being passed, being, I presume, attracted by the smell of the hides. One specimen actually took up its position for the night half way down the hatch, was comfortably covered up and conveyed, I have no doubt, safely to our next port, Mayotte, one of the Comoro group, where we arrived early the following morning. No doubt it went ashore, and quite likely reproduced its species. The former method of dispersal was illustrated the same evening, when we were about twenty miles from Majunga, steering a little north of west. There was a fairly stiff westerly breeze, and just after sunset I noticed a large *Papilio*—black and yellow with very pronounced spatulate tails to the hind wings—being driven by the wind over the ship. The butterfly kept head to wind, and made no attempt to battle against it, but allowed itself to be carried along, merely keeping a certain height above the water. There was a full moon at the time, and it was a beautiful starlight evening, and I have no doubt the butterfly arrived safely at some point on the Madagascar coast during the night. It must have come at least one hundred and fifty miles, *i. e.* if it came from any of the Comoro Islands. I do not know whether any such butterfly occurs on any of these islands (I did not observe it at Mayotte), and if it does not it must have come from the east coast of Africa, across the Mozambique channel, a distance of some two or three hundred miles. I may mention that some years ago a fine specimen of *Papilio hector* came on board our steamer at 9 p.m., the evening before we arrived at Colombo. I have in my collection a specimen of *Euplœa gondoti*, captured at Flacq on the east coast of Mauritius. It is a species peculiar to Réunion, and quite unknown in Mauritius. This insect was in all probability carried by the wind from the one island to the other; though the extreme rarity of such an occurrence is shown by the fact that, though of a tough constitution and well able to withstand rough usage, it has not succeeded in

* 'Bijlage Arch. Java-Suikerindustrie,' 1898, 154–8, figs. 1–4.

† 'Das Zuckerrohr und Seine Kultur,' 320 and 390–6, figs. 52–5.

establishing itself in Mauritius. When we consider, however, that the island is only thirty-six miles in expanse, and therefore a mere speck in the vast expanse of the Indian Ocean, the chance of an involuntary migrant from Réunion, though only one hundred miles off, landing safely in Mauritius is exceedingly remote. I have also a mangled male specimen of *H. bolina*, which was taken close to the harbour of Port Louis; it probably came in some steamer, possibly from the Seychelles. I have only seen one other Mauritius specimen, which is a female, and it also was taken close to the town.—N. MANDERS; Lieut.-Col. R.A.M.C.

THE HAWAIIAN ENTOMOLOGICAL SOCIETY. — Founded in December, 1904, and the first regular meeting held in January, 1905, this little society has already published three parts of its 'Proceedings,' amounting to 112 pp. and 2 plates; while Part 4, with about 40 pp. and one or two plates, is in the press. The society has the distinction of being the only entomological society—or at least the only one publishing—outside of Europe and North America. Its principal object is the study of Hawaiian insects, though other topics are not neglected. The most interesting papers in Part 3 are (1) by Dr. Perkins, describing a new species of *Proterhinus* from Samoa, this isolated genus being only known from the Hawaiian Islands previously; (2) by O. H. Swezey, describing a new genus of Asiracidae, *Dictyophorodelphax*, with enormously elongate head, resembling that of certain Dictyophorinae.

NOTE ON THE LARVA OF SCOTOSIA RHAMNATA, Schiff.—When examining the leaves of a buckthorn-bush near Midhurst last summer, I discovered two nearly full-fed larvæ of this species. In colour they closely resembled the larvæ of *Gonepteryx rhamni*, L., and rested in a similar manner on the upper side of the leaf along the midrib, holding on near the base of the leaf with the claspers, slightly arching the abdominal segments away from the leaf, and bending down the thoracic segments so as to touch the leaf again at the apex. They are not easy to see, as they assimilate so well with the general appearance of the leaf, and even when seen may easily be passed over as larvæ of *G. rhamni*. The first moth emerged on 5th July and the second the day following.—H. LEONARD SICH; Midhurst, July, 1907.

PORTHESIA CHRYSORRHEA.—Reading Mr. Adkin's note (p. 164, *antea*) on the distribution of this species, I recall that when I was at school at Folkestone, and during the summers of 1877, and I think also 1878, we used to come across the larvæ in some numbers. I have forgotten the exact locality, but if my memory serves me rightly, it was somewhere along the lower Sandgate Road; probably in the underwood of the little copses near to the sea which were then apparently just planted. I have never collected in the neighbourhood since, and it would be interesting to hear whether the migrants of subsequent generations have established themselves in or near the old haunt. In 'La Feuille des Jeunes Naturalistes' notices have recently been published of the abundance and also of the disappearance in some localities of *chrysorrhæa* across the Channel in France.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, July 8th, 1907.

THE TROPHONIUS FORM OF *PAPILIO CENEA*.—From notes by Roland Trimen, F.R.S., &c., and G. A. K. Marshall, F.E.S. and myself, in my paper on *P. cenea*, Trans. Ent. Soc. of London, December, 1904, page 687, I fancy the proportion of the above form of the female has been underestimated, and I think a report of the captures, &c., of this form during the end of April and up to the 18th of May may be of sufficient interest to record. I have been taking careful observation myself, and also asked the following collectors to let me know of their captures of this rare form, and they are as follows:—April 27th, saw one at Umbilo, near Durban, G. F. Leigh. May 5th and 13th, captured one at Durban, G. F. Leigh. May 18th, saw one in the town, Smith Street, Durban, G. F. Leigh. May 5th, captured three, Overport, Durban, A. H. Clarke. May 3rd or 4th, seen by Mr. A. D. Millar, in Ridge Road, Durban. May 3rd, captured on the Bluff, Durban, Mr. Green. May 1st, captured by Mr. Berensberg, Durban. This is all I have heard of, but no doubt other collectors, not known to me, have also taken specimens. It seems to me that this is a very unusual number to be accounted for in about a month, but probably my asking these gentlemen to let me know how many they took caused them to be more keen in hunting up this insect. It might easily be mistaken on the wing, no doubt, for *Danais chrysippus*, unless a careful look-out was kept. I have seen several of the specimens mentioned and only two of them were varieties. Both were slightly damaged, the one taken by Mr. Berensberg, and the one taken by myself on May 13th; both have brown markings in the white spots at the tip of the fore wings. The specimen seen by me to-day in one of the busy streets in town must have flown out from the Albert Park, where this species is fairly common at certain times of the year.—G. F. LEIGH; Durban, Natal, May 18th, 1907.

ON THE DISCOVERY OF THE FOOD-PLANT OF *ACIPTILIA* (*BUCKLERIA*) *PALUDUM*, Zell.—Few entomological problems have resulted more satisfactorily than the finding out of the food-plant of this pretty little moth. It has been a problem of much interest to myself, having worked at it for many years, though its solution is entirely due to Mr. Eustace Banks, who fortunately obtained the practical skill of Dr. T. A. Chapman in finally working out the full proof of the problem's solution. *Aciptilia paludum* had, by the year 1886, become practically a lost British insect, when it was found in fair abundance by myself and my sons in a small bog on Bloxworth Heath.* The moth occurred here regularly every succeeding season, as well as, less abundantly, later on in the Isle of Purbeck, where it was met with by the Rev. C. Digby and by Mr. Eustace Banks. Of course our ambition now was to find out its food-plant and manner of life. We gradually exhausted the list of plants growing where the insect appeared; all our efforts, however, to guess, or to pitch upon, the right plant, whether by accident or design, failed for nearly twenty years. There remained, however, one plant—the sundew (*Drosera*)—whose likelihood to be the true one certainly never crossed our minds;

* See 'Proceedings of the Dorset Natural History and Antiquarian Field Club,' vol. viii, p. 57, Pl. ii. fig. 4, 1887.

though Mr. Bankes tells me that it did occur to him some few years ago, but only to be dismissed at the time as an untenable idea. Probably there was scarcely then an entomologist living who would not have at once almost scouted the idea that this plant could in any way furnish food for the larvæ of such a delicate little insect; a plant so apparently, by its peculiar powers and predilections, inimical to insect-life. Another circumstance also tended to prevent the discovery of the larva, inasmuch as no female of this moth had ever, certainly in our experience, been found to have laid any eggs after capture. However, matters went on with the problem still unsolved, from 1886 to 1904, when, on the 20th of August in that year, Mr. Bankes came over to Bloxworth to endeavour to obtain the insect once more in its original haunts, if haply he might get females, and obtain a batch of eggs, with a view to experimenting upon the larvæ with the unlikely sundew. Mr. Bankes that evening captured a number of the insect, among them being several females, from one or more of which a few eggs were obtained. Plants of several kinds were put in for the moths to lay their eggs upon, among the plants a stem of *Drosera*, and only upon this such eggs as were obtained, or at any rate most of them, were deposited. The eggs were at once placed by Mr. Bankes in Dr. Chapman's hands, with a supply of sundew, and the succeeding efforts and unwearied care bestowed upon the problem by Dr. Chapman are related at great length by himself in his paper on the subject in the 'Transactions of the Entomological Society of London,' 1906, pp. 133-154, Pl. vii. One of the most curious facts arising out of the rearing of this insect was that the part of the sundew which one would have supposed would be carefully avoided by the minute and delicate larvæ was the very part specially devoured by them, that is the glutinous secretion with which the foliage of the plant is furnished, and with the aid of which it is wont to supply its own need of insect-food. With the clue thus given, by Mr. Bankes' efforts, larvæ were found in the following May (1905) by Dr. Chapman, in the Esher district of Surrey, upon the sundew growing there, and from these, towards the end of June, the perfect insects were bred. Thus, though Mr. Bankes' larvæ failed to produce the perfect moth, the finding through his clue by Dr. Chapman of others in their natural state, and the rearing of the insect from them, has settled this very interesting twenty-year problem. — O. PICKARD-CAMBRIDGE; Bloxworth, June 25th, 1907.

THE ENTOMOLOGICAL CLUB.—A meeting was held on March 19th last, at 27, Hereford Square, S.W., the residence of Mr. A. J. Chitty, the host and chairman of the evening. The other members present were Messrs. Adkin (R.), Donisthorpe, Hall (T. W.), Porritt, and Verrall. There were also fourteen visitors.

On the invitation of Mr. G. T. Porritt, of Huddersfield, a meeting was held at the 'Hand and Spear' Hotel, Weybridge, on July 8th last. Seventeen sat down to supper, including the following members:—Messrs. Adkin (R.), Chitty, Donisthorpe, Hall, and Porritt.

CAPTURES AND FIELD REPORTS.

AMPHIDASYS VAR. DOUBLEDAYARIA IN NORTHAMPTONSHIRE.—It may interest readers of the 'Entomologist' to know that a female specimen of *Amphidasys betularia doubledayaria* was picked up here a few days since.—N. CHARLES ROTHSCHILD; Ashton Wold, Oundle, Northamptonshire, July 10th, 1907.

SEsia ANDRENIFORMIS BRED.—From a small faggot of mined sticks of dogwood that I collected, quite a large number of parasitical flies have come forth, but, I am pleased to add, one example of *S. andreniformis* also. The latter emerged on July 18th last.—J. OVENDEN; Frindsbury, Richester.

COLIAS EDUSA IN THE ISLE OF WIGHT.—I saw a specimen of *C. edusa* to-day, June 28th. The butterflies have not appeared to be numerous yet. Amongst those observed are the following:—*Pamphila sylvanus*, *Cupido minima* (common), *Lycæna icarus*, *L. bellargus*, *Callophrys rubi*, *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Vanessa io*, *V. urticæ*, *Pyrameis cardui*, *P. atalanta*, *Pararge megæra*, *P. egeria* (both common), *Cænonympha pamphilus*.—JOHN WRIGHT; Freshwater, June 28th, 1907.

SPHINX CONVULVULI IN ISLE OF WIGHT.—On July 9th, at Ventnor, I took a specimen of *Sphinx convulvuli* which, no doubt, had been brought here by the high wind which had been blowing on the two previous days, but the date is surely an early one for its capture. This appears to be a very disappointing season for entomologists, a week's collecting in Parkhurst Forest showing meagre results. Usually I have found *Limenitis sibylla* very abundant there at this date, but I only saw one. The lateness of the season would scarcely be sufficient to account for this. *Argynnis paphia* was flying, but not common. Generally I have taken *A. aglaia* and *A. adippe*, but none were to be seen. *Melanargia galathea* only in small numbers. In previous seasons I have done well in Parkhurst Forest. It would be interesting to know how collectors have fared in other parts of the country.—AWDRY DOBRÉE; Udney Hall, Teddington, July 19th, 1907.

PLUSIA MONETA AT BURTON-ON-TRENT.—It may be of interest to note that *Plusia moneta* has turned up here. I do not know how far north it has yet extended in England, but I imagine it is by no means common yet outside the southern counties. I have in my possession another specimen reported to have been taken here six years ago, but I had regarded it with some suspicion as probably a southern specimen.—A. C. HAYWARD; The Croft, Repton, Burton-on-Trent, July 5th.

CHÆROCAMPA CELERIO IN NORTH CORNWALL.—Whilst on a visit to the North Cornish coast during the latter half of June, I had the pleasure of taking a fine specimen of *Charocampa celerio* on the evening of the 20th, about 11.30 p.m. I found it resting on the flowering stem of sorrel. It does not appear to be an immigrant, as its condition is perfect.—G. B. OLIVER; Tettenthal, Wolverhampton, July 16th, 1907.

NOTE ON *DIANTHÆCIA LUTEAGO* VAR. *FICKLINI*.—Last year a female of *Dianthæcia luteago* var. *ficklini*, captured in Cornwall, deposited three eggs in a chip box. The larvæ hatched, and were fed on the flowers of *Silene maritima* until the first moult, and having to leave the district, I put them out on an isolated plant, and in November I got the son of the people with whom I had stayed to dig up the whole plant and search among the roots for pupæ. One was found, and the moth, a female, emerged on the 14th inst. The colour of the larva, when small, is a dirty white, with a well-developed plate on second segment, and a brown head. The pupa is similar in colour and shape to that of *D. conspersa*.—G. B. OLIVER; Tettenhall, Wolverhampton, July 16th, 1907.

STAUROPOUS FAGI IN WARWICKSHIRE.—On June 15th I took a fine female specimen of this moth, at 6 p.m., at rest on a sycamore trunk in Princethorpe Wood, near Rugby. I believe this to be the first imago of this species taken in Warwickshire, the only previous record being a larva taken by a Rugby schoolboy some years ago.—HUBERT LANGLEY; Narborough House, Leamington.

PAPILIO MACHAON IN NORTH LINCOLNSHIRE.—I have to note the occurrence of *Papilio machaon* near the shore at Tetney, North Lincolnshire, in July, 1906.—F. W. SOWERBY, R.N.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Thursday, May 23rd, 1907.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Brown exhibited (1), varieties of *Trachea piniperda* from Oxshott, in some the red markings were dominant and in others the green; (2), a dark *Agrotis exclamationis* from Folkestone; and (3), a very light *A. puta* from Deal.—Mr. Ashby, a long series of the ant-beetle, *Thanasimus formicarius*, from Oxshott, where it had occurred commonly.

Thursday, June 13th, the President in the chair.—Mr. West, of Greenwich, exhibited the rare Coleopteron, *Triplax lacordairei*, and the uncommon Hemipteron, *Verlusia rhomboidea*, both from Darenth.—Mr. Tonge, a living larva of *Issoria latona*, reared from an ovum sent from Hyères by Dr. Chapman.—Mr. Henry J. Turner, a specimen of *Tinea cloacella* just taken in Greenwich Park, and the living larvæ of *Coleophora discordella*, sent by Mr. Wilkenson, of Workington.—Dr. Chapman, (1) living larvæ of *Calocampa exoleta*, and remarked on their curious custom of feeding on stale food-plant; and (2), varieties of *Papilio machaon*, in one of which the costa of the fore wings was much more arched than usual towards the apex, and in the other the black inner line of the dark submarginal band was wanting and the black basal circle of the ocellus was absent. Several species of larvæ were noted as having the same habit as *C. exoleta* and in their final instars voluntarily changing their pabulum.

June 27th, the President in the chair.—Mr. Sich reported he

had just seen a living specimen of *Amphidasys betularia* in Montague Street, W.—Mr. R. Adkin exhibited specimens of *Hesperia malva* var. *taras*, from near Hailsham.—Mr. West (Greenwich), three rare species of Coleoptera from Darenth Wood, viz., *Cryptocephalus 6-punctatus*, *Apoderus coryli*, and *Byctiscus betuleti*.—Mr. Carr, the remarkable pupa of *Hylophila bicolorana*, which was taken during the Society's field meeting at Fetcham Common.—Mr. Schooling, (1) a variety of *Euchelia jacobæ* having the apical spot united with the submarginal blotch; (2) a variety of *Bapta temerata* having the two dark costal markings closely approximated; and (3), short bred series of *Melanthia albicillata* and *Boarmia abietaria*.—Mr. Main reported that, in the Isle of Wight, he had met with a few *Melitæa cinxia* and had obtained ova. *Cupido minima* and *Agriades bellargus* were also flying. He noted the females of the latter species as being unusually blue.—A discussion took place as to the green tinge apparent in many white Lepidoptera for a short time after emergence.—Mr. Adkin reported that he had just bred *Tortrix pronubana*, and thus proved it to be double-brooded. Probably it was continuously brooded in its usual habitat.—Mr. Adkin then gave a short account of the Congress of the S. E. Union of Scientific Societies, held at Woolwich from June 12th to 15th.—HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — May 7th, 1907.—Rev. C. R. N. Burrows exhibited *Acronycta auricoma*, ex Sabine collection, labelled Abbots Wood, but undated; also *Tæniocampa stabilis* ab. *pallida* (Tutt), Mucking, 1903, *Mamestra anceps* ab. *renardii* (Bdo.), Mucking, 1902, and ab. *ochracea* (Tutt), Rainham, 1896, and hybrid (?) *Oporabia dilutata* × *christyi*.—Mr. J. A. Clark, *Anarta cordigera*, Raunoch, 1906.—Mr. A. W. Mera, larvæ and imagines of *Oporabia autumnaria* and *O. christyi*.—Mr. T. H. L. Grosvenor recorded the occurrence of imagines of *Anarta myrtilli*, *Hesperia malva*, and *Saturnia carpinii* in Reigate district on May 5th.

May 21st.—*Melanippe fluctuata* was the special feature of the evening, and series from various localities were exhibited by several members; var. *costovata* was sparingly represented in most of the series, showing that the form is generally distributed, but does not seem to show any tendency to form a local race.—Mr. J. A. Clark exhibited a particularly fine series, including most of the named and some as yet unnamed forms, while Mr. Prout showed allied species collected in all parts of the world.—Other exhibits were as follows:—Mr. S. J. Bell, larvæ of *Polia chi* in last stadium, bred from Yorkshire ova.—Mr. J. A. Clark, *Aleucis pictaria*, bred from ova laid by Epping Forest female.—Dr. G. G. C. Hodgson, ova of *Gonepteryx rhamni*, which he had observed to be generally found in groups of three or more on a single leaf; as he found that these batches usually hatched simultaneously, he suggested that the female evidently lays more than one ovum on a leaf, this being contrary to what he believed to be the general impression.—Mr. L. W. Newman, larvæ of *Argynnis paphia* in penultimate stadium, bred *ab ovo*; also pupæ of *Aporia crategi*, bred from ova laid by East Kent female.—Mr. J. Riches, almost full-fed larvæ of *Polia flavocincta*.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

Additions to the Wild Fauna and Flora of the Royal Botanic Gardens, Kew. III. Lepidoptera. By A. LANGLEY SIMMONS. ('Bulletin of Miscellaneous Information,' No. 5, 1907.)

WORKING out the fauna and flora of a small, well-defined area—always an interesting process—promises for Kew Gardens to prove of special interest. Within the bounds of the Gardens no great acreage is enclosed, yet it is wonderful how rich and varied a fauna has already been found existent therein, and at present the lists of species noticed for most groups of animals can be described as "preliminary" only.

In the contribution before us we have thirty-one pages of matter, illustrated by one plate—a flash-light photograph of a "sugar-patch" with eight specimens of *Noctua xanthographa*. Mr. A. L. Simmons, with Messrs. G. Nicholson and A. Sich as coadjutors, must have worked hard during 1906 to add 228 species to the previous list of Lepidoptera. The newly-discovered species comprise 2 hawk-moths, 2 Notodonts, 1 Liparid, 44 Noctuids, 46 Geometers, 28 Pyralids, 43 Tortrices, 60 of the Tineina, and 2 of the Micropterygina. Some of the most noteworthy additions are:—*Triphæna subsequa*, *Caradrina ambigua*, *Plusia moneta*, *Aspilates citraria*, *Chilo phragmitellus*, *Pandemis dumetana*, *Chrysoclista linneella*, *Scythris chenopodiella*, *Yponomeuta vigintipunctatus*, and *Adela cuprella*. Mr. R. South was asked to examine the insects before the list was finally compiled.

Systematic work throughout the year was the means of achieving so fine a result. The insects were sought for in all stages, and most of the methods in use by collectors were employed to entrap the perfect insects. "Sugaring" was tried from April to the end of October, and in the latter part of the period with success; "light" was more or less a failure. Not a few cases of "melanism" are recorded, and these are specially interesting in this instance; but whether it is well, while the cause of melanism is under discussion, to state definitely that the soot of the Metropolis is the cause of it, seems a little open to question. It is unfair, perhaps, to call attention to the only misprint seen—*jacobæa* (for *jacobææ*) on page 157.

W. J. L.

The Insect Hunter's Companion. By the Rev. JOSEPH GREENE, M.A. Being Instructions for Collecting and Preserving Butterflies, Moths, Beetles, Bees, Flies, &c. Revised and extended by A. B. FARN. Fifth Edition. London: West, Newman & Co. 1907.

If we desired to adversely criticise this modest little volume, we should do so on the lines that it does not adequately represent up-to-date knowledge. On reflection, however, we recognize the fact that whatever information happens to be available at the present day has been largely acquired by those who may very possibly have started their entomological studies under the guidance of books such as this. Further, we appreciate the reviser's observations in the preface to this, the fifth edition, where he remarks "that it has been sought to leave untouched, as far as possible, the information as first given"; and, again, "I should wish that the memory of the late Rev. Joseph Greene should live long, not only with his contemporaries, but that it should be transmitted through many generations of entomologists yet to come."

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VARIETY OF *MELITÆA ATHALIA* VAR. *EOS*, HAW.

By F. W. FROHAWK, M.B.O.U., F.E.S.



THE accompanying figures represent a very beautiful variety of *Melitæa athalia* which I had the pleasure of capturing on June 23rd last, in Sussex. As will be seen by the drawing, the black basal markings of the primaries are intensified and suffused, and are almost absent over the rest of these wings except the dark marginal band; excepting the small indistinct discal spot, a submarginal series of fulvous spots and a streak of the same colour along the inner margin, the secondaries are wholly blackish. The under surface is unusually handsome; the primaries have two large discal black spots and bold black bars through the central area, and a submarginal series of small black spots; the secondaries have the basal portion boldly marked with black and fulvous, a broad, plain, creamy-white, median band, followed by series of fine black crescents and fulvous spots, and a submarginal row of small dusky lunules on a bright straw-yellow ground colour. All the fulvous colouring is particularly bright and rich. The specimen is in very perfect condition, apparently emerged just previous to capture.

In the 'Entomologist' for June, 1877, vol. x. p. 145, are figures of both upper and under sides of an almost identical

variety of this species, with accompanying notes by the late Mr. S. Stevens. This particular specimen was captured one hundred and four years ago (1803) "at Peckham, near London," by Mr. Howard, and recorded in the old Entomological Society's Proceedings, and figured in J. F. Stephens's 'Illustrations of British Entomology,' vol. i. 1828, and copied into Humphrey's and Westwood's 'British Butterflies,' 1841, pl. 8, figs. 13, 14; as these works are scarce, Mr. Stevens considered it desirable that fresh figures of the insect should be given in this journal thirty years ago. He states, at the sale of Haworth's collection in 1834, which contained the specimen in question, it was bought by Dr. Ashburton, whose collection was likewise sold a few years afterwards, when Mr. Stevens then purchased it, and at the sale of the first portion of his fine collection at Stevens's auction-rooms, on March 27th, 1900, the specimen again changed hands. On comparing the illustrations of the two varieties, the one I now figure is apparently the most beautiful and extreme form of this variety, being further removed from typical *athalia*, and on the under side the secondaries are perfectly symmetrical as regards markings, whereas in the figure published by Stevens the markings do not correspond on these wings.

NOTES ON THE BUTTERFLIES OF DIGNE.

BY GERARD H. GURNEY, F.E.S., &c.

AFTER having been abroad, at Hyères, for three weeks during April of this year, I had not expected to have been on the Continent again until July; however, owing to a variety of circumstances, I found I should not be able to leave England either during July or August, but was able to get away for three weeks in June, which sudden change of arrangements rather, for the moment, upset my summer plan of campaign. However, this was not of such an elaborate nature but that after a little consideration I was able to adapt myself to circumstances, and decide that my three weeks abroad—or, at any rate, a part of it—should be spent at Digne; and so, after the long and rather tiring journey *viâ* Lyons, Grenoble, and Veynes, I found myself deposited, with my luggage, on the platform at St. Aubau Station at four o'clock on the afternoon of June 4th, where, after a short wait of fifteen minutes, another train slowly trundled me on for the short remaining half-hour it takes to get to Digne. I found a comfortable room reserved for me at the 'Boyer Mistre Hotel,' and, after a wash and a change, I went a short stroll before dinner. The evening was glorious and very warm, and my hopes rose with the thought of the rarities to be caught on the morrow, and also with the charm, which never lessens, of once

again being in the dreamy South, and in pursuit of my favourite hobby. It was six o'clock, and therefore I did not see very many insects during that first walk. A bit of wall facing south, which had been thoroughly well "baked" by the sun during the day, was the sleeping place of five or six *Pararge moera*, which allowed themselves to be pill-boxed without any difficulty; and further along, where a gateway was let into the wall, two fine "tigers," a male *Rhyparia purpurata* and a splendidly marked *Arctia fasciata*, were resting on the door, both in excellent condition.

Next day (the 5th) broke clear and cloudless, and the weather for the remainder of my stay at Digne was, with the exception of two days, when it poured in torrents without stopping, of the most perfect description—continual brilliant sunshine without a break day after day, though the wind generally got up about one o'clock—so that it was well to be up and on one's ground as early as possible. I do not think very many entomologists choose to go to Digne at the beginning of June; May or July and August are much more favourite times. In June one is, so to speak, between two broods—the spring things are going over, and the summer insects are not yet out. This year it has been a very late season all over the South of France; the extremely cold and wintry spell of weather which there was at the beginning of March finished off the effects of a bad winter, and delayed the emergences of the butterflies, and Digne was as behindhand as everywhere else; so that I found many things which in an ordinary season would have been worn to rags still in fairly good condition. *Leucophasia duponcheli* was plentiful and generally distributed, flitting hither and thither wherever it could find some shade. Many of the males were in excellent condition, and showed but little signs of wear. A few *L. sinapis* were flying with them. Three females of *L. duponcheli*, which I had caged over a collection of *Vicias*, *Lotus corniculatus*, and *Lathyrus pratensis*, in the hope of getting ova, were one morning exposed to the direct rays of the sun, and although it was still early, and they were not in the sun for more than five minutes, yet it was sufficient to kill them all, so delicate are they. This was unfortunate, as they were the only females I came across. *Cupido sebrus* was fairly common in one or two places—i. e. on the Dourbes Road, where the first track begins to ascend the mountain after leaving the Octroi, and in the Eaux Thermales Valley, where they were flying about in company with *Everes argiades*; but by June 6th they were beginning to show distinct signs of wear. They varied somewhat in size, one male being an exceedingly small one.

Another of the special butterflies at Digne was *Melitæa deione*; this was not uncommon, and, as it was in good condition, I was able to get a nice series of this most interesting *Melitæa*—renewing an acquaintance with the Rhone Valley form, "*berisals*—

ensis." Other insects observed on my first day's walk along the Dourbes Road, over the ridge of La Collette and back by the Cemetery, included *Carcharodus lavateræ*, *Pyrgus sao* (common), *Chrysophanus dorilis*, *Cupido minima*, *Nomiades cyllarus* (extremely abundant, but quickly going over, though some of the females were still presentable), *N. melanops*, *Polyommatus bellargus*, with fine "*ceronus*-like" females (if such a term is permitted), *P. corydon*, *P. hylas*, *Rusticus argyrogognomon* (rather a fine form), one *Thecla spini* (just out), *Thais mediseicaste*, *Parnassius apollo*, *Euchloë euphenoides*, *Melitæa aurinia* with var. *provincialis* (abundant but *passé*), *M. phæbe*, *M. cinxia*, *M. didyma*, *Polygonia egea* (worn), *Limenitis camilla* (very common and in most beautiful condition), and *Erebia erias*. This latter butterfly I found fairly plentiful wherever I went round Digne, its slow flopping flight making it appear to be an easy insect to catch, but it has an irritating way of flying along over some impossible bit of ground, just out of reach of the collector's net, where it seems to know it is perfectly safe. It was a good deal worn, and in bad condition, though the females were fresh; on the Dourbes, a week later, I found it quite fresh, and it must emerge a good fortnight later there than it does at Digne.

On the ridge of the hill behind Le Bleone, I found *Anthocharis tagis* var. *bellezina*. It was very local, indeed; in fact, I only took it in one place right at the top, and it was very far from common; of the six specimens I took, only three were fresh enough for the cabinet, and the others, being males, were released. Although there were several *Anthocharis belia* var. *ausonia* flying in the same place, I found no difficulty in distinguishing *bellezina* from them on the wing, their extremely small size alone rendering them unlike anything else. I found it a few days later—on the 16th, to be exact—much commoner about half a mile to the west of the little village of Villars, half-way up the Dourbes. Here I was able to take a short series of seven or eight specimens in good order, with two females, and should have got more only they flew very swiftly over an extremely bad bit of ground, where one's only chance of success was to stand still and intercept them as they flew quickly by. The females, which are considerably larger than the males, are much more difficult to distinguish from *ausonia*, not only when flying, but even when dead I find considerable difficulty in separating the two species to my satisfaction.

Far and away the best collecting-ground, when I was at Digne, was the Eaux Thermales Valley, and the little lateral valley which runs into it about half-way up. Here I found *E. argiades*, swarms of *P. bellargus* in all the glory of first emergence, together with a good many *P. corydon* and *P. hylas*, *Lycæna arion*, a few worn *P. baton*, *Thecla ilicis*, with ab. *cæsculi* (very abundant after the 15th of June), *Colias edusa*, *C. hyale*, *Argynnis adippe*,

Brenthis euphrosyne, *Melitæa athalia*, *C. dorilis*, *C. alciphron* var. *gordius* (very fresh and fine), *Cænonympha arcania* (abundant and in the pink of condition), and a splendid black-banded form of *Melanargia galatea* var. *procida*.

(To be continued.)

SOME FURTHER NOTES ON THE DIURNI OF THE DEPARTMENT OF AISNE (FRANCE).

BY W. G. SHELDON, F.E.S.

THE few days I had spent in the Forest of Villers Cotterets, which is situated in this Department, in 1906 (see 'Entomologist,' vol. xl. p. 75), made me wish for further acquaintance with the district, and learning from Monsieur Brown that the woods in the neighbourhood of Laon were good for certain species, including *Limenitis populi*, which I especially wanted, I journeyed thither on the 19th of June last, accompanied by Messrs. P. W. Abbott and E. F. S. Tylecote.

We stayed there until June 28th, and afterwards spent five days in the Forest of Villers Cotterets, returning to England on July 4th. The weather throughout was unpropitious there, as everywhere in Western Europe, with but little sun, and we were only favoured with two really good days.

With the exception that some species, including *Apatura iris* and a *ilia*, which we hoped to obtain during the last few days of our stay, did not appear at all, the season did not seem to be a late one; at any rate, not so much so as was the case in England, and a number of species were quite up to date.

Limenitis populi was not uncommon near Laon, where we obtained by hard work and much walking some fifty specimens during our stay; two examples were also netted at Villers Cotterets. The majority were var. *tremulæ*, and intermediates between that variety and the type; of my series of sixteen specimens, three are typical, some half-dozen are var. *tremulæ* or near it, and the remainder intermediates.

The habits of the imago much resemble those of the Apaturidæ; they are to be seen flying over the tree-tops at a height of thirty to forty feet, and they come down at intervals, in the roads running through the woods, settling on horse-droppings and moist spots, and on cold dull days they have a habit of settling on the dry white road, I think, for warmth.

The flight is much slower and heavier than that of the Apaturidæ, though they can fly fast when startled; they are very sluggish when settled on the ground, allowing the net to be placed over them, and in some cases to remain so for several seconds before they attempt to rise.

The only *Apatura* seen in any stage was a pupa of *A. ilia*, which I spied suspended from the under side of a leaf of *Populus tremula*, and which produced a male example of the var. *clytie* after my return to England.

Another interesting species observed was *Melitæa matura*, which was not infrequent and in fair order, though a fortnight earlier would have been a better time for the majority of the specimens captured. *M. matura* in this district frequents chiefly woods that have had the undergrowth cut a few years back; the flight very much resembles that of *Vanessa urticæ*, which it is easy to mistake it for on the wing; it is very partial to settling on a bush, and from thence taking a short, rapid, hovering flight, returning to the same bush and twig and settling again.

In the marshes *Chrysophanus hippothoë* was in great numbers, and of both sexes, in the finest condition; the females were very variable, some of the examples being very brightly coppered, whilst others were almost black, with very little copper on the upper sides. Amongst my captures of this species was a male example without the principal row of ocelli which obtains in the type on the under sides of all wings. *Nomiades semiargus* was abundant in the marshes, and in the finest condition. *Melitæa aurinia* was also abundant in the marshes, but *passé*.

In the woods *Aporia crategi* occurred plentifully, and examples of *Leucophasia sinapis* were observed; *Limenitis sibylla* was very abundant and fresh; *Melitæa athalia* and *M. dictynna* were common generally; *Pararge achine* flew abundantly in the shady rides; *Erebia medusa* was frequent, but almost all the specimens were past their best; *Thecla pruni* flew round bushes commonly; *Brenthis ino* was very abundant everywhere, and was in the finest condition, with plenty of females; *Cænonympha arcania* flew freely by the sides of the rides; *Grapta c-album* was just emerging as we came away. *Thecla w-album* would doubtless have been abundant later on, but the only example actually observed was a pupa found by myself on the under side of an elm-leaf.

The larvæ of *Vanessa urticæ* and *V. io* swarmed on every patch of nettles. *Hesperia alveus* was frequent and freshly emerged. A newly emerged specimen of *Thecla ilicis* was taken, and one each of *Brenthis dia* and *Pararge mæra*. One small locality produced a few specimens of *Nomiades cyllarus* in fine condition.

Broods of *Vanessa polychloros* larvæ had been abundant on poplar and elm, and a few late larvæ were taken. The pupæ were to be found hung up under projecting copings of walls, &c.; and one found by Mr. Abbott attached to a grass-stem was at least one hundred yards from any possible food-plant.

The larvæ of *Araschnia levana* were to be found on their food-

plant nettle not infrequently. The broods numbered from thirty to a hundred specimens each; the majority at the latter part of our stay were full-grown, but others were still very small. Those brought home pupated and emerged as var. *prorsa*, with a few var. *porima*, and intermediates, between July 20th and the end of the month; some, however, are remaining over, and will, I suppose, emerge next spring as the typical form.

From the examples bred I selected a dozen pairs, which I confined in a large gauze cage in the garden, introducing the food-plant and some flowers for them to feed upon. I observed two pairings, and eventually obtained seven batches of ova. The method of ova-depositing of this species is very unusual and interesting. The female affixes herself firmly to the leaf of a nettle—apparently without much preference as to which surface, for, of the seven batches of ova obtained, four were on the under side, and three on the upper side of the leaf; she then deposits an ova on the leaf. The ova are barrel-shaped and ribbed longitudinally; one end of the barrel is attached to the leaf. She next deposits another ova on the other barrel-shaped end of the first ova, and on this second ova another one, until there is a row of ova of from nine to twenty projecting from the leaf, approximately, at right angles from its surface. She then forms other rows, until the number of rows is from five to ten, and the number of ova in each batch from forty to one hundred. I cannot say whether the female deposits all her ova on one leaf, or if, after she has deposited one batch, she goes to a second or third leaf, but I am inclined to think the former is the case. The ova, when deposited, are bright green, but after a few days they turn dull yellow-green, and then a day or so before emergence black. The length of each ova is about half a millimetre, and thus the rows of ova vary from five to ten millimetres in length.

A few examples of the imago of the spring and typical form were flying in the woods at Laon in not bad condition, considering that they must have been on the wing some six or eight weeks.

NOTES ON *LYCÆNA* *ARGIADES*, PALL = *AMYNTAS*, HÜBN.

BY THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S.

M. CHARLES OBERTHÜR published rather more than twelve months ago an interesting note on the above-mentioned insect,* which we translate in its entirety. The note reads as follows:—

* 'La Feuillee des Jeunes Naturalistes,' Quatrième Série, No. 429, p. 149, 1er Juillet, 1906.

"*Lycæna amyntas* and *coretas*. Two very distinct seasonal forms of *Lycæna amyntas* occur in Brittany. The spring form is smaller than the summer one. The female of the former has the wings on the upper surface more or less dusted with blue, whilst the upper surface of the wings of the female which emerges in the months of July and August is quite black, the hind wings having a small orange spot immediately above the tiny tail. In Brittany both the spring and summer forms have two or three small yellow marginal spots on the under side, which are more strongly marked in the summer race. Finally, in Brittany the two seasonal forms of *amyntas* present a striking peculiarity in respect to their habitats. In May this *Lycæna* occurs in the meadows and grass rides in the woods, while in July it is practically confined to the heaths where the heather is high. I am inclined to consider that the two seasonal forms of *amyntas* occur in the whole of the west and south-west of France as they do in Brittany.

"In the Eastern Pyrenees, where we have collected more than sixty specimens, some in the spring and some in the summer, the female is invariably black above, without the orange marginal spot on the hind wings. Both sexes, moreover, lack the yellow marginal spots on the under side. As in Brittany, the summer is generally larger than the spring form, and sometimes the tail of the hind wings is wanting. This is the *Lycæna coretas* of Oechsenheimer and Gerhard. I am inclined to think that *coretas* is a distinct species from *amyntas*. I have specimens of both *amyntas* and *coretas* from the Basses Alpes. In the neighbourhood of Digne these two *Lycænas* are found in the same localities, but in the Eastern Pyrenees (Villefranche-de-Confient and Vernet-les-Bains) and in the neighbourhood of Rennes they seem to inhabit different localities.

"*Amyntas* is distributed over Manchuria, China (Chang-Hai), and in Japan. *Coretas*, however, has not been found in Asia.

"From Yunnan I possess a new variety (or possibly species) of which the male has broad black margins to the fore wings.

"In France it would be interesting to record the localities where *amyntas* and *coretas* occur together and separately. I appeal to the kindness of the readers of 'La Feuille' to inform us on this point.

"Hübner has figured under the numbers 319, 320, and 321, under the name of *tiresias*, *coretas* of Oechsenheimer and Gerhard.

"The same author has figured *amyntas* forma *estivalis* under the numbers 322, 323, and 324."

The names used in the above article are not those of the last edition of Staudinger and Rebel's 'Catalogue,' in which work *tiresias* of Hübner is given as a synonym of *polysperchon*, Berg. If this view be correct, *tiresias* must be a name for the form with the yellow marginal spots on the under side, the spring generation of *argiades* = *amyntas*, and not of *coretas* of Oechsenheimer.

Mr. Oberthür refers to two most interesting but quite different points, the first being that the spring and summer broods of *argiades* = *amyntas* occur in quite different localities; and the second, that *argiades* = *amyntas* is a distinct species from *coretas*. The occurrence of the two broods of the same species of butter-

fly in quite different localities seems worthy of further investigation, and I should be interested to know to which form the few known British examples of *L. argiades* belong, and also if these examples can be referred to *argiades* proper or to *coretas*.

CURRENT NOTES (NEW SERIES).

BY G. W. KIRKALDY.

1. AINSLIE, C. N.: "Notes on the Swarming of a Species of Crane-fly," Can. Ent. xxxix. 26-8 (January 12th, 1907). Diptera.
2. BANKS, N.: "A Revision of the Tyroglyphidæ of the United States," Bull. U. S. Ent., techn. ser. 13, pp. 1-34, pls. i.-vi. (November 14th, 1906). Arachnida.
3. COBB, N. A.: "Fungus Maladies of the Sugar Cane, with Notes on Associated Insects and Nematodes," Bull. H. S. P. A., Pathol., v. 1-208, figs. 1-99, pls. i.-vi. [including Report by L. Lewton-Brain] (November, 1906). Diptera, Coleoptera.
4. DAVIS, W. T.: "Insects as the Food of Squirrels," Can. Ent. xxxix. 16 (January 12th, 1907).
5. DYAR, H. G., and KNAB, F.: "The Larvæ of Culicidæ classified as Independent Organisms," J. N. York E. S. xiv. 169-230 (December, 1906). Diptera.
6. ESCHERICK, K.: "Beiträge zur Kenntniss der Thysanuren, ii." Zool. Anz. xxx. 737-49, figs. 1-5 (October 16th, 1906).
7. FULLER, C.: "Some Remarks upon the Mahambanendhlwana Mystery," Natal Agr. J. ix. 837-41 (September 28th, 1906). Lepidoptera.
8. GAULLE, J. DE: "Catalogue Systematique et Biologique des Hymenoptères des France," Feuille Jeunes Nat. xxxvi. 137-41, 162-4, 178-80, 189-92; xxxvii. 9-13 and 34-6 (July 1st-December 1st, 1906).
9. GIRAULT, A. A.: "Trichogamma pretiosa, Riley. Oviposition—a Résumé," Psyche, xiii. 137-48 (December, 1906). Hymenoptera.
10. GOSSARD, H. A., and HOUSER, J. S.: "The Hessian Fly, Mayetiola destructor, Say," Bull. Ohio Agr. Sta. 177, pp. 1-40, plate, text-map, and figs. 1-2 (August, 1906). Diptera.
11. KIRKALDY, G. W.: "Notes on the Classification and Nomenclature of the Hemipterous Superfamily Miroidea," Can. Ent. xxxviii. 369-76 (November 6th, 1906).
12. LÉCAILLON, A.: "Sur la ponte des œufs et la vie larvaire des Tabanides," A. S. E. France, lxxiv. 20-8, pl. i. (1905). Diptera.

13. LUCAS, R., WANDOLLECK, B., and KUHLGATZ, T.: "Bericht über die Wissenschaftlichen Leistungen im Gebiete der Entomologie während des Jahres 1901" [ii. pt. 2], pp. i-viii and 913-1584 (1906).
14. MARLATT, C. L.: "The San Jose or Chinese Scale," Bull. U. S. Ent. 62, pp. 1-89, pls. i.-ix. figs. 1-12 (December 5th, 1906). Hemiptera, Coleoptera, &c
15. OSHANIN, B.: "Verzeichnis der Paläarktischen Hemipteren mit besonderer Berücksichtigung ihrer Verteilung im Russischen Reiche i. Heteroptera i. Lief. Pentatomidæ-Lygæidæ," Yezh. Zool. Mus. Imp. Akad. Nauk [Petersburg], xi. pp. i-lxxiv and 1-393; and ii. Homoptera I. Lief. p. 1-192 (1906).
16. PERKINS, R. C. L.: "The Insects of Tantalus," P. Hawaiian E. S. i. 38-51 (December 1st, 1906).
17. ID.: "A new Method of Relaxing and Cleaning Specimens," *op. cit.* 52-3.
18. PEYERIMHOFF, P. DE: "Recherches sur la Faune Cavernicole des Basses-Alpes," A. S. E. France, lxxv. 20-22, one map.
19. ID.: "Considérations sur les Origines de la Faune Souterraine," *op. cit.* 223-33 (July, 1906).
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21. RILEY, W. A.: "A Case of Pseudoparasitism by Dipterous Larvæ," Can. Ent. xxxviii. 413 (December 10th, 1906).
22. ID.: "Some Recent Work on the Development of Hymenopterous Parasites," Ent. News, xviii. 9-11 (January, 1907).
23. SCHULTZ, O.: "Gynandromorphe Makrolepidopteren der Paläarktischen Fauna," Ent. Zeitschr. (Guben) xx. 214-5 (December, 1906).
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25. SCOURFIELD, D. J.: "Mendelism and Microscopy," J. Quekett Micr. Club (2), ix. 395-422 (November, 1906).
26. SILTALA, A. J.: "Zur Kenntniss der Parasiten der Trichopteren," Zeit. Wiss. Insektenbiol. xii. 382-6, figs. 1-3 (December 30th, 1906).
27. SMITH, A. E.: "Note on Stereo-photo-micrography," J. Quekett Micr. Club (2), ix. 429-30, figs. 1-2, plates 31-3 (November, 1906).
28. SOAR, C. D.: "Notes and Observations on the Life History of Fresh-water Mites," *op. cit.* 359-70, pls. 26-30 (November, 1906). Arachnida, Hemiptera, Neuroptera, Diptera.
29. SWEZEY, O. H.: "Life History Notes and Observations on

- Three Common Moths," P. Hawaiian E. S. i. 53-8 (December 1st, 1906). Lepidoptera.
30. TERRY, F. W.: "Increase of the Antennal Segments in the Forficulids, *Chelisoches morio* (Fabricius) and *Forficula auricularia*, Linnæus," *op. cit.* 58-9 (December 1st, 1906). Orthoptera.
 31. WHITE, G. F.: "The Bacteria of the Apiary, with Special Reference to Bee Diseases," Bull. U. S. Ent., techn. 14, pp. 1-50 (November 6th, 1906). Hymenoptera.
 32. WILLEM, V.: "Une Observation sur le Macroglosse," A. S. E. Belg. l. pp. 418-20 (December 31st, 1906). Lepidoptera.
 33. WILLISTON, S. W.: "Some Common Errors in the Nomenclature of the Dipterous Wing," *Psyche*, xiii. 154-7, fig. (December, 1906).
 34. ID.: "The Classification of the Culicidæ," Can. Ent. xxxviii. 384-8 (December 10th, 1906). Diptera.
 35. WILSON, J.: "Report of the [U. S. A.] Secretary of Agriculture, 1906," 1-112 (1906).
 36. XAMBEU, —: "Mœurs et Metamorphoses des espèces du Genre *Silpha*," Le Nat. xxviii. 264-6 and 277-9 (November 15th and December 1st, 1906). Coleoptera.
 37. [anon]: "An Abstract of Bulletin No. 30, about some Injurious Insects," Imp. Agr. Exp. Sta. in Japan, pp. 1-11 (March, 1904). Hemiptera, Diptera, Coleoptera, Lepidoptera, Hymenoptera.
 38. 'Experiment Station Record.' xviii. Nos. 1-4, containing pp. 1-400 (September-December, 1906).

The U. S. Experiment Station Record (38) has entered upon its eighteenth volume. It is issued monthly, and includes brief summaries of the papers on economic entomology published throughout the world.

The 'Bericht der Entomologie' for 1901 has now been completed (13). Though greatly delayed, it is treated in great deal, occupying 1584 pages as against 374 in the 'Zoological Record' for that year.

The Report of the United States Secretary of Agriculture (35) deals with entomology on pp. 70-7, and especially with the introduction of beneficial insects. The systematic introduction from Europe of parasites to cope with the Gypsy Moth and Browntail Moth has been at last started, and success has apparently attended the initial efforts.

The thirtieth bulletin of the Japanese Imperial Agricultural Station was written entirely in Japanese, but a summary in English has been issued. Eleven coloured plates of metamorphoses accompanied the original. The following insects were discussed:—

1. *Enaria lewisi*, Scott, pl. i., a Cimicid bug which damages rice.

2. *Tipula parva*, Löw, pl. ii., a dipteran whose larvæ destroy the seed-grains of the rice plant by gnawing the young plants just below the surface of the soil.

3. *Jathesia chrysographella*, Moore, pl. iii., a lepidopteron injurious to rice.

4. *Nematus* sp., pl. iv., a sawfly injurious to pear-trees.

5. *Apriona rugicollis*, Chevr., pl. v., a beetle-pest of the mulberry.

6. *Diaspis patelliformis*, Sasaki, pl. vi., a Coccid pest of the same.

7. *Porthesia auriflua*, Hübn., pl. vii.

8. *Hemerophila atrilineata*, Butler, pl. viii.

9. *Zamaera albofasciaria*, Leech, pl. ix.; the last three being lepidopterous pests of the mulberry.

10. *Ophalmodes cretacæ*, Butl., pl. x.a, a lepidopterous (Geometer) pest of tea.

11. *Tetigonia guttigera*, Uhler, pl. x.b.

12. *T. ferruginea* (Fabr.), pl. xi., leaf-hopper pests of pine and mulberry respectively.

Scourfield's summary of Mendelism and its relation to Microscopy (25), and Smith's notes on Stereo-photo-micrography (27) will be interesting to many entomologists.

Perkins summarizes (16) the insects of a mountain summit, with its subordinate peaks, near Honolulu, the collecting-ground most accessible to that city. All the orders are discussed, with notes on the habits of many species, and remarks on the changes in the locality during the past fifteen years. The same author details (17) a new method of relaxing and cleaning insects, boiling water, soap, and naphthaline constituting the ingredients of the new formula.

Preissecker discusses the enemies of tobacco in Dalmatia (20), including *Agrotis* spp., the plant-louse (*Myzus plantagineus*), and Orthoptera, Thysanoptera, and Coleoptera. Davis writes on insects as the food of squirrels (4).

Peyerimhoff has published two interesting notices on cave-entomology (18 and 19). The caves are in the neighbourhood of Digne, in the department of Basses-Alpes.

Cobb's report on fungus maladies of the sugar-cane (3) contains extended notices on Diptera and Coleoptera connected with the dissemination of fungus spores. It is proved that *Ithyphallus* spores are spread in the excreta of Diptera, and digestion in this order is discussed at length, together with the power of flight, vision, &c. There is also a short note on the relation of the Nitidulid beetle *Carpophilus* sp. to the "Pine-apple Disease of Sugar Cane" (*Thielariopsis*). Altogether forty pages and six figures are specially devoted to insects.

Escherich makes further contributions to a study of the Thysanura (6). Terry notes that the method of increase of the

antennal segments in the instars of a Hawaiian earwig is not the same as in the common British form (30); the data in the latter case are, however, fragmentary and apparently inaccurate. Siltala discusses the parasites of Trichoptera (26).

Oshanin has commenced (15) a catalogue, with references, synonymy, &c., of the palæarctic Hemiptera, including Japan, &c. The first part of the first volume deals with Cimicidæ, Lygæidæ, Pyrrhocoridæ, Geocoridæ; the first part of the second with the Cicadoidea. For these groups Oshanin records 1335 and 784 species respectively. Puton in 1889 admitted 1011 and 730, but he excluded China and Japan.

Kirkaldy summarizes (11) Reuter's recent classification of the Miridæ, and translates the analytical key of the divisions, as well as making numerous additions and corrections to his own recent nomenclatorial paper on the Hemiptera.

Marlatt has brought Bulletin 12 of the same series up to date (14), discussing the Coccid *Aspidiotus perniciosus*.

Fuller remarks on the supposed poisonous properties of "bagworms" (Psychidæ) (7). Schultz discusses certain palæarctic gynandromorphous Macro-Lepidoptera (23). Willem makes an observation additional to the recent ones of Plateau on *Macroglossa* (32). Swezey details the life-history in Hawaii (29) of *Plusia chalcites*, *Spodoptera exigua*, and *S. mauritia*; as the second is found in the British Isles his paper will be of interest to British lepidopterists.

Schuster deals biologically (24) with several species of *Crioceris*, and Xamheu (36) with *Silpha*. Gaulle has commenced (8) a systematic and biological catalogue of French Hymenoptera.

White describes certain bee-diseases (31). Girault details the oviposition of the Chalcidid *Trichogramma* (or *Chætostricha*) *pretiosa*, parasitic on the sawfly *Pteronus* (or *Nematus*) *ribesii*. The sawfly is common to Europe and North America, but the parasite has only been recorded from the latter so far, though other species of the genus are European (9). Riley briefly summarises (22) Silvestri's recent biologic work on *Litomastix*.

Williston criticizes the methods of certain recent workers on Culicids (34), and corrects some common errors in the nomenclature of the dipterous wing (33). Dyar and Knab (5) describe a large number of Culicid larvæ, many being treated as new species independently of the adults. In an editorial, Dyar declares (p. 231) that the date of this paper is March 14th, 1906, authors' separata having been distributed on that date. The correct date, however, is December, the journal having been issued apparently during that month. Gossard and Houser bring forward some fresh facts relative to the life-history of the Hessian Fly (10). Ainslie has some notes on the swarming of the Tipulid *Trichocera bimacula* (!). Riley mentions the case of larvæ of a *Sarcophaga* in a tumour in the back of a woman (21). Lécaillon reviews

existing literature on the metamorphoses of Tabanidæ, and details those of *Tabanus quadrinotatus* (12).

Banks's revision of the Tyroglyphidæ (2) is a valuable contribution to the knowledge of the difficult "cheese-mites" and "sugar-mites." Soar deals with the relation of Hydrachnids (28) to their parasitism on aquatic insects.

NOTES ON THE GENUS *EUPITHECIA*.

BY LOUIS B. PROUT, F.E.S.

(Continued from p. 175.)

ANOTHER question raised by Mr. Dadd in the same place (Ent. Rec. xviii. 259) concerned the *innotata* group (*innotata*, Hfn., *fraxinata*, Crewe, and *tamarisciata*, Frr.), and although I do not know that I have any fresh light to throw on these, a survey of what is known may prove helpful. Mr. Tutt (*loc. cit.*) rightly girded at the German entomologists for undiscriminatingly using "var. *fraxinata*, Crewe," for the second generation of *innotata*, Hfn., whereas in Britain *fraxinata* is single-brooded, hibernating as a pupa; but the question of possible specific identity cannot be summarily dismissed on this ground. It has been definitely ascertained that larvæ from the early brood of *innotata* will feed on ash and other leaves (see below, and compare the case of *E. virgaureata*, to be discussed later), and it has also been ascertained that there is occasionally a second brood of *fraxinata* in England, and that the larvæ obtained from this will accept mugwort as a food-plant (*vide* Crewe in Ent. Annual, 1865, pp. 124-5). It is therefore not inconceivable that the regular economy further south than with us is to alternate, according to the season, between the flower-feeding and tree-feeding habit, but that in Britain, being practically driven into single-broodedness, it has split up (or is in course of doing so) into two races, one favouring each pabulum. It seems to me that ash-feeding summer larvæ, if deprived by climatic conditions of the autumnal emergence of their imagines, would concurrently be deprived of the later autumn mugwort larvæ, and an ash-feeding race could be established; while a belated emergence from hibernated pupæ (say, about Midsummer instead of in April and May, as in Germany) might at the same time bridge over the period in which a tree-feeding habit would have been necessary, and result in the laying of eggs on *Artemisia*, &c., which might by that time be sufficiently advanced to be serviceable. I know that all this is highly speculative, and that even if it be in accordance with fact it does not absolutely settle the question whether it were more expedient

to treat the forms (in Britain) as one species or as two; although, for my own part, I consider that two forms co-existing within the same area and maintaining separate life-cycles are better called "species," and may, in the absence of evidence to the contrary, be assumed to have passed beyond the stage of inter-crossing. We must not forget, moreover, that the descriptions given by Crewe and Westwood (Ent. Ann. 1863, pp. 116-121) indicate wide larval divergence, although the German *innotata* larva is also excessively variable. A good summary of the descriptions and the literature will be found in Hofmann's 'Raupen,' edition 1893, pp. 265-6. Rössler was the first to record finding the larva of *innotata* on sloe (Wien. Ent. Monats. viii. 131), and in 'Die Schuppenflügler' (p. 195) he gave a longish note summarizing what was then (1881) known in Germany of larval food-plants, times of year, &c., and concluding that *fraxinata* (bred in June or later from larvæ occurring in June on ash, sloe, whitethorn, mountain ash, flowers of dog-rose, &c.) was the second brood of *innotata*, and *tamarisciata*, Frr. (on *Myricaria germanica* and *Tamarix gallica*), a dark southern form of the same. Bohatsch followed (Wien. Ent. Zeit. i. 163) with a note supporting the same contention, and recording the breeding of the *fraxinata* form in August (as a second brood) from larvæ on buckthorn and oak; and in the same periodical (iii. 296) he recorded that Habich had bred, between July 15th and August 15th, this same *second brood* form from part of a batch of hibernated pupæ of which the rest had emerged normally in the spring as typical *innotata*. Habich himself confirmed this some years later (Stett. Ent. Zeit. liii. 159), and added the record of a further experiment; he obtained a pairing of bred *innotata* in the early spring, fed the larvæ on rose leaves, and got them full fed by the end of April, the imagines appearing irregularly through the months of May, June, July, and August, nearly half of the total number in the last month. They were smaller and lighter than typical *innotata*, and their larvæ were somewhat more slender, and in a few cases almost unicolorous green.

In the meantime Dietze made some observations on the different larval races of what he considered *E. fraxinata* (Stett. Ent. Zeit. xxxiii. 197-9, xxxvi. 69-70), from which we learn that he found no considerable differences between the *Prunus* larvæ and those of the ash, but that there was a difference between the eggs, both of which he describes (xxxvi. p. 70); he points out, however, that he only had six freshly laid eggs of the ash race to compare, and that the differences may have been peculiar to the individual brood. Imagines reared from ash laid their eggs both on ash and hawthorn, and I gather that the larvæ (second brood, August) accepted both, but their further history is not traced. Dietze regards both forms as definitely double-brooded, and

makes no reference to any offer of *Artemisia* to the later brood of larvæ.

Stange (Stett. Ent. Zeit. xlvii. 281) also records some personal experiences of *innotata*, of which he bred a few *ex ovo* on *Artemisia vulgaris*, which hibernated as pupæ, and one from a beaten larva from rose, which emerged on August 4th the same year. He inclines to the view of Rössler "and Speyer" (*ubi?*) that all three of the group are modifications of one species.

Millière (Ann. Soc. Lyon xix. 30, 31) has brief notes on all the three larvæ of the group; he treats *tamarisciata* as a valid species (larva uniform light green, on *Myricaria germanica*, and not varying), "*fraxinata* of the English" (which he found in June, 1863, on *Coriaria myrtifolia*) as well removed from *innotata* by the form and colour of the larva (green, excepting the vinous anal flap), but perhaps only a variety of *tamarisciata*.

The British form of *innotata* larva is described by Hellins (Ent. Mo. Mag. xxi. 137) under the title of "an enigma," the solution being given later in notes by Warren and by Hellins himself (Ent. Mo. Mag. xxii. 257, xxiii. 115, xxiv. 10); Hellins' notes, with a later description by Buckler, are given in full in Buckler's 'Larvæ,' viii. 35, and a figure added, pl. 136, fig. 6. The usual British form seems exceedingly different from the gay green, red-marked form which is prevalent in Germany, Southern France, &c.; but Warren says his British examples were variable, and I have already mentioned that the Continental are extremely so. The one or two larvæ I have myself found (at Sandown, on *Artemisia vulgaris*) agreed, so far as I can recollect, with Hellins' description and Buckler's figure. Barrett records (Lep. Brit. ix. 105) that Mr. Robson, of Hartlepool, has found and reared *E. fraxinata* on flowers of scabious; probably Mr. Robson knew the larva, otherwise one would be inclined to refer the record to *innotata*, as both occur at Hartlepool.

Dr. Draudt, in describing the eggs of *E. innotata* ('Iris,' xviii. 315, pl. vii., fig. 4), says that that of "var. *fraxinata*, Crewe," is entirely like it, and that the same can probably be said of "var. *tamarisciata*, Frr." Perhaps the genitalia will throw some further light on the subject. Schröder's elaborate description and figure of the apparatus in *innotata* (Ill. Zeit. Ent. v. 305) is purely anatomical, and does not deal with the allied forms.

III.—DENOTATA, VIRGAUREATA, &c.

A pair of species whose probable specific identity has hardly been at all discussed are *E. denotata*, Hb. (*campanulata*, H.-S.), and *jasioncata*, Crewe. The British forms look so very distinct in the imago state that, although Crewe noticed the great similarity of the larvæ, and the botanical relationship of the

food-plants, he does not seem to have thought it possible that the two might be co-specific. Probably Crewe was not acquainted with the dark mountain var. (ab.) of *denotata* known as *atraria*, H.-S. = *ferreata*, Fuchs (J. B. Nass. Ver. Nat. liv. 57), which Herr Püngeler tells me is certainly co-specific with the typical form, all intermediates occurring among bred specimens (*in litt.* November 29th, 1905), while it is practically indistinguishable from some of the lighter specimens of *jasioncata*. Rössler and Fuchs, it is true, regarded Herrich-Schaffner's *atraria* as representing a dark form of *castigata*, Hb., hence Fuchs's new name for that of *denotata*; but even if they were right, this would not affect the connection established by the last-named between *denotata* and *jasioncata*.

That *E. denotata* is not confined to *Campanula trachelium* is clear not only from Crewe's record (Ent. Mo. Mag. vii. 143) of finding larvæ in his garden on nine other species of *Campanula* and on *Phyteuma*, but also from several Continental writers. Püngeler finds the larvæ of var. *atraria*, H.-S., at Pontresina, &c., on *Campanula barbata*, and my correspondents, Herr Dietze and Dr. Draudt, tell me that, last autumn, larvæ entirely agreeing with those of this species and of *jasioncata* were found at Oberstdorf (Bavaria) on *Phyteuma spicatum*. Nor is this all; if *primulata*, Mill., is, as it has been determined, really = var. *atraria*, H.-S., *Primula latifolia* must be added to the list, whilst, if Fuchs's *denotata* and ab. *solidaginis* (J. B. Nass. Ver. Nat. lv. 78) are rightly placed by that author, it has also taken, exceptionally, to *Solidago virgaurea* in a state of nature, unless his son somehow mixed the larvæ he collected.

Last September I had a large number of larvæ of *E. jasioncata*, collected in North Cornwall, and several of *E. denotata*, from Dorking. Both were variable, though less excessively so than many of the "pugs," but I absolutely failed to find any difference between the two. The pupæ, which are now before me, are also identical. The *E. jasioncata* are already emerging (early June), and I believe this is naturally a somewhat earlier form to appear than *denotata*. In this respect, as Herr Dietze remarks, the Oberstdorf form occurring on *Phyteuma*, and already mentioned above, should belong to the former, for the *Campanula* larvæ were not yet findable when these were taken last August. I have not yet heard from my friends what form of imago resulted from the *Phyteuma* larvæ.

Herr Petersen, of Reval, had a male of each of the supposed species from me a few years ago, and examined the genitalia; he believed he had found differences sufficient to warrant keeping them distinct, and intended to send a note on the subject to one of our British magazines. On the other hand, Mr. Pierce, of Liverpool, writes of *jasioncata* which I sent him: "There is

little doubt it is only *campanulata*, at any rate so far I can see no difference" [*i.e.*, in the male genitalia].

The larvæ of both forms thrive on remarkably dry seeds, and individuals go on feeding far into the autumn. I myself had them both going on healthily up to the beginning of November, but my friend, Mr. John Peed, caps this with a record of *denotata* (*campanulata*) still feeding on 15th December last year!

Eupithecia virgaureata is another very interesting species, particularly as regards its economy. As Mr. Percy Reid raised the question of the food-plant and date of the first-brood larvæ (Ent. Rec. xix. 22), I imagine Klos's note (Verh. Z. B. Ges. Wien. li. 785) is not very generally known to British entomologists. He records that at Stainz, near Gratz, he found on whitethorn and blackthorn, between 24th June and 5th July, 1901, some thirty larvæ which at once reminded him, in their scheme of markings, of *E. virgaureata*, although they were darker, being of a chestnut brown colour. To his surprise, the moths emerged, from 29th July to 30th August, veritable *virgaureata*, though much smaller than the type and of a darker ash-grey shade, with the spots bounding the central area well pronounced and united into a band. He had not previously found the species on any plant but *Solidago virgaurea* and *S. canadensis*, on which it was abundant in his district; he had never found it on gentians or umbellifers, sometimes given as food-plants, the larvæ which he found on *Gentiana asclepiadea* always producing *castigata*. He is unaware whether there is ordinarily a second brood; in his district it appears, in a state of nature, at the end of March if mild, or in mid-April if cold—not in May and June, as given by other observers.

There are some other curious records of food-plants for this species, and some of them may safely be accepted as authentic, though it is possible that one or two rest on a mis-identification of the closely allied, variable, and polyphagous *E. castigata*. I do not call the flowers of *Senecio* a "curious record" for it, as they are allied to the golden rod; Crewe found it thrive well in captivity on *Senecio* (Ent. Ann. 1861, p. 135—under the old, erroneous name of *pimpinellata*—and 1863, p. 127); Hellins found this the favourite natural food-plant in Devon (Ent. Ann. 1862, p. 47); and, if I remember aright, Mr. G. F. Porritt has told me that it also inhabits ragwort on some of our coast sand-hills. In the 'Zoologist' for 1862, p. 8208, it is recorded on the same plant both in Devon and at Albury (Surrey), and there are doubtless other such records scattered throughout our magazines. More remarkable, but no doubt reliable, on account of the authority on which it is given, is the "on flowers of ling" of Buckler's 'Larvæ' (viii., expl. of pl. cxxxii.); and I fancy that "millefoil," given by Barrett, is also taken from the work of one of our old English masters. The gentian and umbellifer records

mentioned by Klos originate with Bohatsch (or ? Schieferer), and are from Klos's own district, Gratz; Bohatsch ('Iris,' vi. 4) writes that there, though no doubt it occurs on *Solidago*, yet it is "much commoner on *Heracleum sphondylium* and *Gentiana*." He points out (*ibid.*, p. 3) that the male moth can be separated from its allies by the fascicles of cilia of the antenna. Gregson (Proc. North. Ent. Soc., 27th June, 1863, p. 16) reports Greening to have reared fine imagines on leaves of sallow, also (Zool. xx. 7902) to have bred it from seed-heads of *Lychnis dioica* (!), but I will not guarantee that he did not confuse his species.

That there is a second brood has long been accepted in England; it was recorded (though only for a state of captivity) by Crewe in the Ent. Annual, 1863, p. 126. It will probably be remembered that from May ova he raised a brood which fed up with great rapidity on flowers of cow-parsley (*Anthriscus sylvestris*), had all pupated by the end of June, and produced imagines from the end of July to the beginning of August. Like those reared by Klos, these were smaller and darker than the first brood.

(To be continued.)

NOTES AND OBSERVATIONS.

TORTRIX PRONUBANA, Hb., AT CHISWICK.—On July 18th, while beating in the garden here about 6.30 p.m., I disturbed, from a vine on the wall, a bright orange little moth. It flew very actively, and escaped once out of the net before I was able to box it. From the colour of the hind wings I suspected it to be *Tortrix pronubana*, Hb. The moth was exhibited at the meeting of the South London Society on the 25th inst., when both Mr. Adkin and Mr. South saw it. Below the vine is a bush of *Euonymus japonica*, in which *Capua angustiorana* and other Tortrices occur.—ALFRED SICH; Corney House, Chiswick, Middlesex, July 29th, 1907.

PORTHESIA CHRYSORRHŒA.—Reading Mr. H. Rowland-Brown's note (*ante*, p. 186), in which he asks "if the migrants of subsequent generations have established themselves in or near the old haunt of the Lower Sandgate Road, Folkestone," reminds me that the only ones I have ever taken were in the drawing-room of Castle Glen, Lower Sandgate Road, to light, two on July 30th, and one on August 6th, 1899. All three were females.—JOSEPH F. GREEN; Taverham Hall, Norwich, August 17th, 1907.

ON THE REARING OF PAPILIO PODALIRIUS.—I would be very glad to hear from any reader of the 'Entomologist' who has successfully reared *P. podalirius*. I have tried and have failed, and I want to discover if possible why I failed. This last spring, while on a visit to the South of France, I collected a good many ova off young almond trees; these successfully hatched, but several of the young larvæ died from some cause or other, and when I arrived home early in May I

counted about twenty-five. These I fed on peach, and kept them in a cool greenhouse, where they appeared to do well, and in the end seventeen pupated between June 20th and 30th; but most of the pupæ—which, by the way, were of fine size—appeared to be deformed, the cases for the antennæ looking like crumpled horns. They emerged between July 22nd and August 5th, but not one of them was fit for the cabinet, all being deformed in some way or other. I should like to add that I have brought through a beautiful series of *G. cleopatra* from ova collected at the same time, and they were lodged in the same house as the *P. podalirius*, and it is curious that I should have succeeded in the one case and failed in the other.

EMERGENCE OF NUMERIA PULVERARIA IN JULY AND AUGUST.—In sending me some larvæ of this species in early July last, Mr. F. Pope, of Exeter, suggested that the moths would be reared this year. I rather doubted this, and wrote to him to this effect. In his reply he stated that from eggs deposited by females captured on May 30th last year, the larva fed up quickly on sallow, and by July 28th sixteen moths had appeared. Well, last summer was a favourable one for second generations in species that are normally only single-brooded with us, but one would hardly expect such kind of thing this year. I was therefore agreeably surprised when on August 16th a male *N. pulveraria* emerged. At that date the majority of the larvæ had gone down, but five were still feeding, although apparently full-grown, and two of these continued to do so until the 22nd of the month.—RICHARD SOUTH.

SCARCE HAWK-MOTHS IN KEW GARDENS.—Two imagines of *Deilephila euphorbiae* have been bred from pupæ found under an oak tree in the Queen's Cottage grounds, Kew, on March 2nd, 1907, by Messrs. G. Nicholson and A. L. Simmons. The pupæ were quite close to the surface, about nine inches from the trunk facing north-east, and were in earth-cocoons. Mixed with the earth were small portions of spun silk and minute fragments of leaves. The moths emerged on June 10th and 21st respectively. There are no euphorbias in the immediate neighbourhood where the pupæ were found, consequently we must conclude that they fed up on some other plant. Up to August 5th of this year neither imago nor larva has been found. Tutt, in *Brit. Lep.* vol. iv. p. 235, mentions various other food-plants in addition to the euphorbias—fuchsia, vine-leaves, lettuce, *Polygonum aviculare*, oak, and perhaps *Plantago lanceolata* and dandelion. Messrs. Nicholson and Simmons also found a pupa of *Sphinx pinastri* in the Gardens, but it failed to produce an imago.—W. J. LUCAS.

CAPTURES AND FIELD REPORTS.

ZEPHYRUS QUERCUS ab. BELLA.—Referring to p. 141 of 'Butterflies of the British Isles,' I beg to inform you that on August 11th last I saw and captured, near Dorking, a female *Zephyrus quercus* ab. *bella* (Gerh.). The specimen is slightly undersized.—EDWARD R. GOFFE; 46, Vardens Road, Wandsworth Common, August 12th, 1907.

SESIA ANDRENIFORMIS.—In my note on breeding this species (*ante*, p. 189), I find that I wrote “dogwood” instead of *Viburnum lantana*.—J. OVENDEN.

MYELOPHILA (*MYELOIS*) *CRIBRUM* (*CRIBRELLA*) IN SURREY.—So far as I am aware this species has not been noted as occurring in Surrey. I may therefore record the capture, in the garden here, of a very fine specimen on July 14th last. During the following evening Mr. Norman Riley, who resides next door, captured a specimen that entered an upper room, no doubt attracted by the bright light therein. The example taken by myself, I may add, was disturbed from a row of sweet peas. Possibly this species has a wider distribution than it would seem to have from records of its capture. Perhaps it may often be passed over as *Hyponomeuta cognatellus*.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

PLUSIA MONETA IN THE NEW FOREST.—Contrary to the expectations of some entomologists, this species has undoubtedly established itself in our midst, as it is seventeen or eighteen years ago since it was first taken this side of the Channel. My nephew—Mr. F. V. Brown, of Ashby-de-la-Zouch—having come for a week’s collecting in the Forest, I accompanied him thither, and, although unable to do any practical work myself, I saw a number of *P. moneta* dashing about in the dusk on July 14th, and managed to capture two fine specimens. On the following evening another specimen was taken, but I did not see so many as on the previous date. On searching the garden for its food-plant, I could find but one poor stalk of monkshood, a close scrutiny of which revealed no indications whatever of the larvæ having fed thereon, or of ova being deposited. I am not sure if this is the first record of the species from the Forest, but I may mention that last season I knew of one specimen taken at rest on a tree-trunk, and another came to light near Ringwood. In 1899 the insect is said to have been taken in Wiltshire at sugar, which seems rather a departure from the usual habits of its class, as I do not recollect ever taking any of the genus at the sweetened allurement, but that is no reason why others have not had a different experience.—G. B. CORBIN; Ringwood.

A DAY’S DRAGONFLY COLLECTING AT THE BASINGSTOKE CANAL.—On June 23rd last we went to Byfleet, for the purpose of collecting from the Basingstoke Canal certain species of Agrioninæ which do not appear to occur in the Epping Forest district. The following are a few observations upon the most interesting specimens:—(1.) *Erythromma najas*.—A male was obtained having the right mid-leg in a very rudimentary condition. (2.) *Ischnura elegans*.—Two females of var. *infuscans* were taken, one of them *in cop*. (3.) *Agrion pulchellum*.—In one male, the neck joining the U-shaped spot on segment two with the circlet behind was reduced to a mere thread, and the marking closely resembled that seen in *A. puella* mentioned below. (4.) *A. puella*.—A male had the U-shaped spot on segment two connected with the circlet. (5.) *Enallagma cyathigerum*.—We had the satisfaction of witnessing for ourselves a proceeding connected with oviposition which had been previously recorded of this species, but which seemed difficult of belief. What happened was this: A pair of Agrionines, attached

per collum, were noticed flying close to the surface of the water of the canal. Presently they, or at all events the female, alighted upon a tangle of floating grass and sphagnum moss, and, having been liberated by her partner, she deliberately entered the water, and disappeared from view. The male, presumably for the purpose of assisting the female from the water upon her return to the surface, continued to hover over the site; he was taken, and the species determined as *E. cyathigerum*. In the space of two or three minutes after disappearance, the female was again seen clinging to the under side of the floating vegetable matter. She then quickly climbed up to the upper side, and seemingly prepared herself for flight. The grass was drawn to the bank and the insect secured; she dried off very rapidly, and appeared to be none the worse for her adventure. The impression conveyed by her movements in the water was that during the period of immersion she had descended to a considerable depth.—F. W. & H. CAMPION; 33, Maude Terrace, Walthamstow, Essex.

SHORT LIST OF LEPIDOPTERA COLLECTED NEAR GIBRALTAR IN MARCH AND APRIL, 1907.—I am sending this list in the hope that it may be of use to readers of the 'Entomologist' stationed in the Army or Navy, at Gibraltar:—*Papilio podalirius* and *P. machaon*, common in the hills round the Cork Wood; *Thais rumina*, common in the Cork Wood; *T. polyxena*, several in the Cork Wood; *Aporia crataegi*, one specimen in the Cork Wood; *Pieris brassicae*, *P. rapae*, and *P. napi*, common; *Pontia daplidice*, *Leucophasia sinapis* and *g. v. lathyri*, *Euchloë euphenoides*, and *Colias edusa*, common in the Cork Wood; *Gonepteryx rhamni*, several in the Cork Wood; *G. cleopatra*, abundant in the Cork Wood and on the Rock; *Pyrameis cardui* and *Vanessa urticae*, not common; *V. antiopa*, one, in the Cork Wood; *Melitæa didyma*, two, in the Cork Wood; *Melanargia lachesis*, one male, Benaogan; *M. syllius*, one male, Gaucin; *Erebia tyndarus*, two males, Queen of Spain's Chair; *Satyrus circe*, one near Banaocaz, about 3000 feet elevation; *S. briseis*, one, Campamento Plain, several at Gaucin; *S. arethusa*, one male, in the Cork Wood; *S. statilinus*, several in the Cork Wood; *Pararge megera*, *Epinephele ianira*, and *E. hyperanthus*, very common; *Thecla rubi*, abundant in the woods near Gaucin; *T. spini*, one, in the woods near Gaucin; *Thestor ballus*, one, in the Cork Wood; *Chrysophanus virgaureæ*, fairly numerous; *C. phlaeas*, very common; *Lampides batiscus*, *Lycæna icarus*, *L. hylas (baton)*, and *L. orion (battus)*, common in parts of the Cork Wood; *Deilephila euphorbiae*, one, blown on board, from Gibraltar; *Charocampa celerio*, one, at arc lamp in Gibraltar Dockyard; *Daphnis nerii*, one, near the Signal Station, Gibraltar; *Macroglossa stellatarum*, very common; *Zygæna sarpedon*, one, Benaogan; *Aglaope pruni*, several on hills round Gaucin; *Lithosia lutarella*, two, in the Cork Wood; *Arctia hebe*, one, Benaogan; *A. caia*, common; *Oreopsyche atra (plumifera)*, one, in the woods near Gaucin; *Saturnia pyri*, a few larvæ near Gaucin; *Cnethocampa processionea*, larvæ numerous in second pine wood; *Cerura vinula*, one, at lamp, on board, in Gibraltar; *Uropus ulmi*, at arc lamp, in Gibraltar Dockyard; *Agrotis c-nigrum*, several, at arc lamp, in Gibraltar Dockyard; *Deiopeia pulchella*, several, near Benaocaz, about 2500 feet elevation.—F. W. SOWERBY, R.N., H.M.S. 'Russell,' Atlantic Fleet, July 7th, 1907.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 11th.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Waterer, Brockley, was elected a member.—Mr. Rayward exhibited fine bred specimens of *Agriades bellargus* and *Polyommatus icarus*, and commented upon their size and brilliancy, in spite of the fact that ants were almost constantly in attendance upon the larvæ.—Mr. H. Moore, specimens of *Euchelia jacobææ* from the Dunkirk sand-dunes, one of which was exceedingly pale, and a cricket from Lisbon.—Mr. Gibb, the “Simplex” net, frame, and stick.—Mr. Sich, cocoons of *Cedestis farinatella*, a lepidopteron whose larva lives in the needles of Scotch fir.—Mr. Newman (1) a gynandromorphous specimen of *Amorpha populi*; (2) bred series of *Melitæa aurinia* from Kent and Ireland; (3) a bred series of *M. cinxia*; (4) a *Smerinthus ocellata* with extreme development of the pink colour of the fore wings; (5) bred specimens of *Dicranura bicuspis* from Tilgate; (6) a selection of under sides of *Polyommatus icarus* from North Kent; (7) pupæ and full-grown larvæ of *Argynnis paphia* and *A. adippe*; (8) living larvæ of *Agriades corydon*; (9) bred specimens of *Cucullia gnaphalii*; and (10) very fine and extremely varied series of *Boarmia repandata* from Leigh Woods, Torquay, Epsom, and North Kent, including some extreme var. *conversaria* and melanic forms.—Hy. J. Turner, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*June 4th, 1907.*—Mr. O. E. Janson, of Highgate, was elected a member of the Society.—Rev. C. R. N. Burrows exhibited *Ennomos quercinaria*, including ab. *equestraria*, from Ipswich.—Mr. J. A. Clark, a cabinet drawer of “Thorns,” including a very variable series of *E. quercinaria*, in which abs. *carpinata*, *infusca*, and *equestraria* were all represented; also a fine series of *E. elingvaria*, including Scotch specimens of a deep, almost orange, colour, and without the usual central fascia on fore wings.—Mr. A. W. Mera, melanic *Gonodontis bidentata* from Leeds, also very pale *E. quercinaria* from Ipswich.—Mr. L. B. Prout, *E. quercinaria* ab. *infusca* from South Kensington.—Mr. J. Riches, a long and very variable series of *E. quercinaria* from South Kensington.—Mr. V. E. Shaw, pupæ of *Nola cucullatella* and larvæ of *Xylophasia scolopacina* from Bexley.

June 18th.—Mr. J. A. Clark exhibited *Erannis leucophaæaria*, very dark specimens from New Forest, with usual median band on fore wings practically obsolete.—Dr. T. A. Chapman, larvæ of *Calocampa exoleta* from South Tyrol, which, instead of being green, as in the case of British specimens, were black, with yellow dorsal and lateral stripes and pale whitish subdorsal line.—Mr. E. A. Cockayne, *Nyssia lapponaria* from Rannock, including male with pale yellow dorsal stripe and costa; also, from same district, *Taniocampa gothica* var. *gothicina*, and an almost unicolorous pale brown *T. incerta* with only the reniform and orbicular faintly indicated.—Mr. H. M. Edelsten, *Chilo phragmitellus* male, a very dark, almost black, specimen from Norfolk Broads; also nearly full-fed larvæ of *Lithosia caniola*.—Dr. G. G. C. Hodgson, two *Nemoria viridata* from Surrey, one with

reddish-brown fore wings flecked with irregular green patches and hind wings of usual green colour except at the anal angle, the other of normal coloration with wings dappled with irregular and symmetrical reddish patches.—Mr. A. H. Shepherd, *Erannis leucophaea* var. *fuscata* from Huddersfield, and var. *marmorinaria* from Richmond Park.—Mr. C. W. Simmons, *Synopsis abruptaria* from Holloway, including many very dark examples, and an extraordinary hermaphrodite, the right hand wings being those of an almost black male and the left of typical light female.—Mr. A. W. Willsdon, *T. opima* from Epping Forest district, including pale grey specimen with dark-brown central fascia.—Mr. T. H. L. Grosvenor reported having found a batch of *Bombyx rubi* ova on the wing of a dead jay in Ashdown Forest.—S. J. BELL, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—June 3rd, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. E. C. Rossiter again showed a long series of *Tæniocampæ* bred from pupæ dug near Langley Green and Wyre Forest, to show how the species ran into one another; a large series of *incerta*, Hufn., at one end closely resembled those of *munda*, Esp., and at the other end were with difficulty separated from specimens of *stabilis*, View.; *stabilis*, again, ran into *gracilis*, F.; and there were specimens on each boundary line about which he found it difficult to decide.—Mr. H. Langley showed dark specimens of *Tephrosia luridata*, Goeze, from Princethorpe, where sixty per cent. of the specimens seen were dark; curiously the first to appear were the darkest. The darkest of all were taken on April 20th, and none but dark ones were seen till late in May, when the lighter ones began to appear.—Mr. C. J. Wainwright, insects in amber.—Mr. G. T. Bethune-Baker, a cocoon of *Saturnia pavonia*, L., with two distinct openings; there was, however, only one pupa inside, and it (the cocoon) was of normal size only. He also showed, on behalf of Mr. G. H. Kenrick, a series of *Spilosoma mendica*, Cl., var. *rustica*, Hb., bred from a female captured in the South of Ireland (they all came true to the parent form), also other bred insects. He also showed a number of species of *Spilosoma* and *Phragmatobia* from various European localities, for comparison with Mr. Kenrick's var. *rustica*.—Mr. Chadwich, a visitor, showed various aberrations: *Semiothisa* (*Macaria*) *liturata*, Cl., a specimen from Oakley Wood, apparently of the Delamere form, with dark hind marginal band and general dark colour; a very fine dark *Chrysophanus phleas*, L., from near Claverdon, with broad hind marginal and apical band which monopolised most of the dark colour, leaving only two spots on each fore wing, on the hind wings only a narrowish submarginal band of the ground colour was left; the ground colour was a fine dark coppery red, and the insect altogether was darker than Barrett's darkest. Amongst other aberrations shown was a *Spilosoma lubricipeda*, L., with pinkish border to the wings.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

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PHALERA BUCEPHALA, AB.

In the above aberration of *P. bucephala* the general colour is smoky-grey, the double cross lines are black, and the apical patch is ashy-grey clouded with blackish. The head and thorax and the fringes appear to be normal, but the latter are partly rubbed off in the specimen. The hind wings are of the usual colour, but have a dark grey patch, as shown in the figure.

Mr. Esson, of Aberdeen, who kindly sent it for figuring, informs me that the specimen was bred at Forres, and that he saw it alive.

RICHARD SOUTH.

NOTES ON THE HYMENOPTEROUS FAMILY AGATHIDIDÆ.

BY CLAUDE MORLEY, F.E.S., &c.

THIS family forms, with the Microgasteridæ, of which I have already treated (*cf.* Entom. 1906, p. 99), the Areolarious group of the Braconidæ, and is but sparsely represented by four small genera in Britain. It is, however, very widely distributed throughout the tropical regions of Africa and America, and its species appear to be almost or quite exclusively lepidopterous parasites. Our genera are very easily distinguished if the specimens be not carded:—

Microdus linguarius.—Taken commonly by Butler at Abinger Hammer in August, 1900, and once by Mr. A. Piffard at Felden, in Herts.

M. nugax.—Not hitherto noticed in Britain, and only recorded from Erzgebirge and Frankfort-on-Main. I captured a male on flowers of *Spiræa ulmaria* at Foxhall, in Suffolk, August 10th, 1902, and possess a female taken by W. Saunders in July, 1872, at Greenings, in Surrey.

M. clausethalianus.—Females. Barr, in Ayrshire, in the latter half of July, 1900 (Dalglish); Greenings, in July, 1871 (W. Saunders); and swept in a marsh at Barton Mills, in Suffolk, on June 12th, 1900, by myself.

M. tumidulus.—Abundant. Felden, in Herts (Piffard); Boxhill, in September (Beaumont); bred from *Catoptria hypericana* at Worksop, June 20th, 1904 (Miss Alderson); Greenings, in June, 1871 (W. Saunders); Abinger Hammer (Butler); Shere, in Surrey (Capron); swept from heather at Selby, in Yorks, September 19th, 1902 (Ash). I found the males commonly on tables of *Angelica sylvestris* at Foxhall on August 30th, 1899, and females have occurred to me both there and at Claydon Bridge, near Ipswich, in damp situations, up to September 23rd.

M. rufipes.—Females. Bournemouth, in 1901 (Bradley); Abinger Hammer, early in August, 1900 (Butler); and in the New Forest (Miss Chawner).

EARINUS.

- | | | |
|--------|--------------------------------------|------------------------------|
| (2) 1. | Second segment rufescent . . . | 1. <i>zonator</i> , Marsh. |
| (1) 2. | Second segment black. | |
| (4) 3. | Hind tibiæ apically testaceous . . . | 2. <i>nitidulus</i> , Nees. |
| (3) 4. | Hind tibiæ apically black . . . | 3. <i>gloriorius</i> , Panz. |

Earinus nitidulus.—Common. Taken at Felden by Piffard, and swept by myself in Tuddenham Fen, May 20th, 1904.

E. gloriorius.—Not uncommon. New Forest (Miss Chawner); Cadney, in Lincolnshire, in 1898 (Thornley); I beat it from birch-bushes on May 11th, 1895, and May 18th, 1903, in the Bentley Woods, near Ipswich; and two males from yew at Hollington, near Hastings, as early as March 21st, 1900.

ORGILUS.

- | | | |
|--------|---------------------------------|--------------------------------|
| (2) 1. | Wings normal; palpi black . . . | 1. <i>obscurator</i> , Nees. |
| (1) 2. | Wings small; palpi red . . . | 2. <i>micropterus</i> , sp. n. |

Orgilus obscurator.—Not very common. Several at Felden, in Herts (Piffard); one female bred, with one *Apanteles* and one female *Pezomachus rufipes*,* which last was very probably hyperparasitic upon one or other of the Braconids, from *Butalis senescens*, Stn., at Swanage, in Dorset, between June 8th and

* Cf. my 'Ichneumons of Britain,' vol. ii. 1907, p. 190.

20th, 1895 (E. R. Bankes) ; one female bred from a pine-feeding *Tortrix* [probably *Retinia resinella*, of which it is a known parasite—C. M.] at Oxshott, in July, 1901 (Sich) ; I have swept it in Tuddenham Fen, in Suffolk, and upon the Ringstead Downs, near Hunstanton, in August, 1906, and beaten it from birch in the Bentley Woods, May 29th, 1902.

O. micropterus. — I took the sexes of this new species on *Angelica sylvestris* flowers at Foxhall on September 12th, 1898, and by sweeping at Ringstead, in Norfolk, on August 21st, 1906 ; the type is in my collection. From *O. obscurator*, which is the only other black species with the second segment quadrate, it differs in the red palpi ; distinct hyaline area below the stigma ; anterior femora red, with a narrow black streak above ; tibiæ red, with the hind ones of male infusate ; trochanters mainly, apices of hind and whole of anterior coxæ, red ; basal segment thrice (not twice, as in *O. obscurator*) longer than apically broad, with the spiracles very much more prominent ; second segment distinctly longer, and, except sometimes at its extreme base, entirely glabrous. The male, in addition, has the flagellum longer and red to beyond its centre. In general facies, *O. micropterus* is distinguished by its distinctly longer legs, with the tarsal joints, especially in male, elongate ; the wings do not extend to the anus and are narrower, with the apex and anal angle distinctly less prominent in outline. I find no metathoracic modification such as we are accustomed to associate with the brachypterous forms of usually macropterous Cryptinæ.

Monks Soham House, Suffolk :

May 16th, 1907.

NOTES ON THE GENUS *EUPITHECIA*.

By LOUIS B. PROUT, F.E.S.

(Continued from p. 211.)

ALTHOUGH Klos does not mention unequivocally that his second-brood larvæ were feeding on *leaves*, I think it may safely be assumed that such was the case ; first, because he mentions that his experience is analogous to that already well known with *E. innotata* (see *supra*), and, secondly, because it would probably be hard to find even whitethorn, to say nothing of blackthorn, still in bloom at the beginning of July, especially in a "forward" district like Gratz.

In its times of emergence *E. virgaureata* seems to be rather an erratic species. Moore (Zool. xx. 8208 ; Weekl. Ent. ii. 92) had most of his moths appear from hybernated pupæ in May–June, but a second batch from the same lot of pupæ did not emerge

till the beginning of September, while some pupæ—as is often the case with *venosata*, *pulchellata*, *haworthiata*, *expallidata*, *togata*, &c.—went over two winters.

I half suspect that a further analogy to the alternate tree-feeding and flower-feeding habit will be found to exist in another double-brooded "pug," *Eupithecia albipunctata*. The freshly emerged male found by Crewe on August 19th, and the parents of eggs found by him a few days later (Ent. Ann. 1863, p. 127) could not well have come from larvæ that had fed upon the late-flowering *Angelica*, and Barrett (Lep. Brit. ix. 79) quotes N. M. Richardson as having found that they will feed freely on the leaves of elder, to which an interesting confirmation has just recently (1907) appeared in Dr. Nickerl's 'Spanner des Königreiches Böhmen,' where it is recorded (p. 34) that the senior Nickerl bred a specimen on July 8th from a larva found at Prague in June on elder. Like those of *E. innotata* and *virgaureata*, however, the summer larvæ of *albipunctata* will also accept flowers; for D'Orville, according to Barrett, reared a fine batch, from April eggs, on flowers on *Anthriscus sylvestris*—"there being no other umbelliferous plant obtainable, in blossom, at the time at which these eggs hatched." Some were full grown in a fortnight, and the imagines appeared early in July.

Our other *Angelica*-feeding *Eupithecia*, *E. trisignaria*, is only single-brooded, and therefore has no trouble in finding flowers or seeds of its usual pabulum at the time when the larva needs it, and I believe all the known food-plants are at least related to *Angelica*. The list given in Hofmann's 'Raupen' is *Angelica sylvestris*, *Heracleum sphondylium*, *Pastinaca sativa*, *Peucedanum dreoselinum*, and *Laserpitium latifolium*. Curiously, Barrett does not mention the only plant upon which I have myself found it—*Pastinaca sativa*, on a single head of which I took, at Horsley, the only two larvæ which yet stand to my account for this species! That there was nothing novel in the selection of this food-plant, even for Britain, is clear from Mr. Sheldon's note in the 'Entomologists' Record,' vol. i., p. 70. Dietze, however, has a more remarkable observation (Stett. Ent. Zeit. xxxiii. 199). He once found a great number of larvæ on a completely decayed plant of *Angelica*, and actually saw one of them seize an aphid, lift it up after the manner of a *Syrphus* larva, and then suck it dry. On account of the state of the plant, he was convinced that these larvæ must for a long time have supported themselves entirely on aphides; they were of a dark colour which he had not otherwise seen, the dorsal area being entirely black, and he thinks that this may be attributable to the abnormal diet, but I would suggest that it was quite possibly adaptive to its surroundings. One season when *Eupithecia* larvæ were exceptionally abundant, Dietze found this species common everywhere,

and it even attacked *Pimpinella saxifraga*, *P. magna*, and other Umbelliferæ.

Chloroclystis coronata is another species which, while generally associated with one or two plants (notably clematis), can yet thrive on the most diverse. I once beat a larva from hawthorn in the autumn, which must have fed on the leaves and, at any rate, was reared on them; on another occasion I beat one from sallow, which I took to be this species, but I failed to breed it. Last August, near Bude, I obtained several from bramble, in company with those of *Gymnoscelis pumilata*, and I am pretty sure they ate the fruit as well as the flowers—perhaps, also, the leaves. Like Crewe, I have also found it on *Eupatorium* and on *Angelica* when working for others of the genus. In a note on *C. coronata* (Trans. City Lond. Ent. Soc. ix. 52) I expressed a suspicion that the imago hybernated fully formed in the pupal shell; I find this habit was already known to Dietze nearly thirty years before (Stett. Ent. Zeit. xxxiii. 202). The same thing obtains with the hibernating brood of *Gymnoscelis pumilata*.

Probably a longish chapter might be written on the food-plants and larval habits of *G. pumilata*, but I will content myself with one point. Early last year (1906) Dr. Chapman found, at Hyères, on *Cytisus* (*Calycotome*) *spinosus*, some unknown geometrid ova, from which the larvæ duly hatched, spent their larval period spun up in domiciles among the leaves, after the manner of *Hydriomena furcata* (*sordidata*)—which, rather than any “pug” larva, they resembled in appearance—fed up rapidly on *Cytisus* leaves, and at the end of May produced normal *pumilata*.

NOTES ON THE BUTTERFLIES OF DIGNE.

By GERARD H. GURNEY, F.E.S., &c.

(Continued from p. 197.)

Lycæna iolas was well out during the first week of my stay, and in beautiful order, but unless one is lucky enough to get it at the right time, one will find it in rags, as its rapid, dashing flight through the thick scrub soon makes havoc with its wings, rendering it quite useless from a cabinet point of view. It seemed fairly common, though it is difficult to judge to what extent it is distributed, as it flies over a wide area, and is very hard to catch owing to its living on such rough ground; and the males, at any rate, seemed to me never to go near the *Colutea*—in any case, they never came near the particular plants I happened to be guarding; and, after spending the greater part of one day in the grilling sun, watching four bushes on the steep hillside behind the

Cemetery, which those who know it will remember is a perfect sun-trap, and where by ten o'clock the stony ground becomes so hot one can barely place one's hand upon it, and having during that time only caught one chipped female, I did not consider that form of taking *iolas* good enough, and so adopted another which I found was much less heating, more exciting, and withal more productive of the butterfly in question; and this was to stand (more or less still) in an open gully or track, and intercept them as they flew swiftly down the openings, which they seemed to have rather a *penchant* for doing. In this way the time was enlivened by catching an occasional *Pararge mœra* or *L. duponcheli* as it fluttered past, and I was able to take six fine *iolas* in very good condition; but what interested me far more than catching them was to find a full-fed larva feeding quite exposed on a pod of *Colutea arborescens*, and attended by no fewer than four large black ants, of what species I am afraid I do not know, which were continually running backwards and forwards over the larva, stroking or feeling it with their antennæ, in order to get it to exude a drop of the sweet mixture which, no doubt, in the same way as *Polyommatus bellargus* or *Lycæna arion*, it has the power of doing. It appeared to feel no inconvenience from this performance, and was lying basking on the half-eaten pod. The larva was of a very pale yellowish-green colour, with a dark pink or rose-coloured dorsal line, strongly defined towards the head and tail, and lighter in the middle; the subdorsal lines were a much paler and less conspicuous pink, all three lines being rather thickly spotted with minute black dots; the head was of a pinkish tinge, minutely spotted with black; legs very light greenish colour. This very rough description of the larva was jotted down in my pocket-book when I found it, and, although I had no means of exactly measuring it, it must have been almost an inch in length, and was of a very slug-like appearance. When I got back to my hotel that evening I found it had already eaten its way into another pod of *Colutea*, and in this it remained three days without coming out, the two ants which I had put with it constantly going in and out of the hole in the pod, though I could not see what took place inside. On the third day the pod cracked and came open at one end, and I found the larva had changed into a lightish-brown pupa inside it.

I was glad to find that *Thais mediscaste*, in spite of various reports to the contrary, seems to be holding its own fairly well, though it is an insect which for some reason is more collected than anything else at Digne. Everyone appears to want a larger series of *mediscaste* than of anything else; possibly its showy upper side, which makes a long row look so well in one's cabinet, has something to do with it; but Monsieur Cotte, the professional collector at Digne, assures me people are far more anxious to secure *un grand numero* of *mediscaste* than of any other insect.

As far as I could make out three *T. mediscaste* var. *honoratii* had been taken this year; Cotte himself had taken a magnificent male three days before I arrived. Small larvæ were fairly common on the *Aristolochia*, basking on the leaves of the plants in the hot sun.

On the 17th, at the foot of the rocks of Les Dourbes, after a very hot climb through the thick beech wood, I found *Parnassius mnemosyne*; males were abundant, but only two females, all in very fresh order; and also, in magnificently fresh condition, flying a little higher up, *Erebia stygne* was common. Here also *Polyommatus cumedon* was plentiful, rather a small form, and only just emerged. One was a very interesting aberration; the under side was of a very pale grey colour, and almost devoid of eye-spots on the fore wings, while on the lower wings the wedge-shaped mark was wanting, and the row of black dots was reduced to two black pin-pricks. Flying here also were a lot of fresh *Gonopteryx rhamni*, *Nemeobius lucina* (in much better condition than lower down), a few *Argynnis adippe* and *B. euphrosyne*, with occasional *Euchloë cardamines*, *Colias hyale*, and a single *Erebia evias*.

On the way down, near the little village of Villars, I saw, in the hay-fields, *Papilio podalirius*, and found several half-grown larvæ of this species on small almond trees; *Pontia daplidice*, *L. arion*, *R. argus*, *Melanargia galatea*, and a sprinkling of "burnets," *Zygæna radamanthus*, a few worn *Z. lavandulæ*, and two other species at present not identified. On the arid hills below Villars I saw hardly anything, but the little *epistygne* wood near the bridge was alive with butterflies; specially abundant were *L. bellargus* and *L. corydon*, with a good many *L. hylas*, and I also noted *L. duponcheli*, *Polyommatus escheri*, *Loweia dorilis*, *M. phœbe*, *M. athalia* (just out), *M. didyma*, and a few *Paragegeria*.

On June 18th *Papilio alexanor* made its appearance, and I took a fine male near the baths, and another later in the day nearer Digne, both off thistle-heads, for which it has a well-known predilection; its food-plant (*Sesili montanum*) still, at this date, was barely showing above the ground. In the little fields beyond the baths and by the Eaux Thermales insects were beginning to be abundant; the two previous days of rain had brought things out wonderfully. *A. adippe* was becoming common, a second brood of *Brenthis dia* was appearing, while *C. arcania*, which was plentiful, was beginning to look the worse for wear. *C. lavateræ*, *L. dorilis*, *E. argiades*, *Thecla ilicis*, *P. apollo*, *P. daplidice* (very abundant), were all noted, besides many commoner species.

My last day at Digne (the 19th) was chiefly spent in the little lateral valley running into the Eaux Thermales; here I took another *P. alexanor* and two *Brenthis daphne*, just emerged. It

was amusing to watch the battles between *Chrysophanus gordius*, which was very abundant, and *T. ilicis* for the "chief seats" on the thyme-flowers, or to see a big *A. adippe* "make for" a purple scabious flower already overweighted and overcrowded with a family party of, perhaps, a couple of *Zygæna trifolii*, a fiery *didyma*, and a *M. galatea*, upsetting them all in a most unceremonious way. The stream-banks here were the favourite places for *L. duponcheli*, *L. dorilis* (not common), *E. argiades*, and *M. athalia*, with the usual quantities of the two "blues," *L. corydon* and *L. bellargus*; while a little higher up, disporting themselves on the now full-blooming privet-flowers, were *T. ilicis* (type) and var. *æsculi*, a few fresh *Cyaniris argiolus*, and some very ragged *Grapta egea*. During the day I worked round the hill behind Le Bleone, and here some fresh *Euchloë euphenoides* were out, a single worn male *L. iolas*, with *M. galatea*, *P. daplidice*, and *C. gordius* (plentiful); and by the bridge over the river I saw, but did not take, another *P. alexanor*.

I also got the following list of Arctias during my time at Digne, mostly at "light," on the side of La Collette:—*Arctia maculosa*, *A. casta*, *Rhyparia purpurata* (very common), *Arctia hebe* (one only), *A. fasciata*, *Euprepia pudica*, *Arctia villica*.

HINTS ON THE STUDY OF LEAF-HOPPERS.

By G. W. KIRKALDY.

THE neglect in the British Isles—and elsewhere—of the Heteroptera is perhaps comprehensible. The prejudice against the evil smelling few is extended to the entire suborder, and the interest of their structure and life-history is overlooked. It is difficult, however, to understand why this neglect is even greater in the case of the Homoptera, and particularly the "leaf-hoppers." They possess no malodorous glands, their forms are, if not usually brightly coloured, at least dainty, and some—for example, *Tomaspis sanguinea* (= *Triecphora vulnerata*), *Tetigonia viridis*, *Dikraneura aureola*, and *Eupteryx atropunctata*—are really pretty.

The following brief notes are written to lead some of the younger entomologists to the most neglected of the larger groups of insects, and to notice some of the leading points of interest in their life-histories and structure. The British leaf-hoppers have been very admirably treated, as regards their systematic description and tabulation, by Mr. James Edwards, but a great deal remains to be done in the discovery of new species, the extension of the distribution of those already known, the determination of food-plants, and the working out of life-histories.

(a) *New Species*.—There must be at least fifty more species

of "Cicadina" alone to be recorded from the British Isles, and the total is quite likely to reach 325 or 330. As rich localities practically unworked, I would specially recommend the Trossachs and surrounding country in Scotland, but there is scarcely a county more than very partially worked at.

(b) *Species already known*.—The locality records in Edwards's work are usually most meagre, which is, of course, not the author's fault but due to the fact that workers are so few.

(c) *Food-plants*.—This is a part of the investigation that requires great care. It is obvious that a plant may be quite an accidental resort of a leaf-hopper. For instance, *Platymetopius undata* has been recorded from *Pteris aquilina* and from *Quercus robur*. Now, of course, it is possible that both records are correct, but it is very doubtful. *Platymetopius undata* is so characteristic that there is no chance of wrong identification of the species. The probability, as it is a well-known fern-feeder, is that it was taken from an oak tree surrounded by fern, the hopper having jumped from the latter to the former, perhaps on the approach of the collector. Though it is well, therefore, to record all plants from which the adults are captured, it is necessary to note specially those in which the eggs are deposited, or upon which the nymphs are found.

(d) *Life-histories*.—The eggs of nearly all the British forms are probably inserted in slits made by the female in leaves, twigs, or stems of plants, the exceptions being *Issus coleoptrata*, which probably lays them on leaves, &c., covering them with flocculent matter, and *Tetigometra impressopunctata*, which lives in ants' nests, often under stones, and apparently drops its eggs in the nest. *Oliarus* and *Cixius* probably lay their eggs under the loose bark of trees.

The nymphs are more or less like the adult in their four or five instars, the rudiments of the flight-organs becoming more and more apparent in each further stage. The tarsi are not jointed, and there are other differences, while the nymphs are often coloured quite differently from the adult. In the Fulgoroid families there are a number of remarkable sensory organs on the head, thorax, tegminal and alar pads, and abdomen.

The nymphs are usually easily reared, in most cases test-tubes of medium size being all that is necessary. The several stages should be described, the points to look for being :—(1) the form of the head, which may differ from that of the adult, and, indeed, in the various nymphal instars; (2) the pattern and colour; (3) the number, colour, and disposition of the bristly hairs on the abdomen. This last character has not been used yet, but is of the greatest importance.

(e) *Parasites*.—Leaf-hoppers are particularly subject to parasites, which are usually easily reared from them. The ova in grasses and elsewhere will yield Chalcid, Eulophid, and Mymarid

Hymenoptera; the nymphs will be found attacked by Diptera of the Pipunculidæ, Hymenoptera of the Dryinidæ and Eucyrtidæ, and Coleoptera of the Stylopidæ.

(f) *Structure*.—This is discussed sufficiently fully by Edwards. Of particular interest are the male genitalia in the “Delphacidæ” and its allies, the mobile tibial spur in the same hoppers, the legs in various “Jassids” and “Acocephalids,” the antennæ of Fulgoroid forms, &c.

I would, however, specially urge anyone wishing to commence the study of leaf-hoppers to rear up the nymphs, which will often be found in company with the adults, to note the plants on which the nymphs feed, and to search the food-plants for indications of the egg-slits. Grasses, rushes, poplars, oaks, and ferns have so far afforded the most species, but the whole flora should be investigated, as many of the hoppers are very sharply restricted in the matter of food-plant.

Anyone proceeding on the general lines I have indicated will find a most fascinating study to hand, and one less worked at than any other insect group of equal extent.

HELPFUL LITERATURE.

EDWARDS (J.).—‘The Hemiptera-Homoptera . . . of the British Islands’ (L. Reeve & Co., London, 1896). The “Cicadina” are discussed on pp. 1-223, &c., and pls. 1-25, &c. There are two editions—one published at something over £2, I believe, with coloured plates, and a smaller one with two structural plates, published at something less than £1. To those who can afford it, I would strongly recommend the former. It is the only volume of the series in which the coloured figures are not daubs.

PERKINS and others.—Bulletins 1-4 of the Hawaiian Sugar Planters’ Association, div. Entom. (1905-1907), dealing with leaf-hoppers and their parasites, comprising about eight hundred pages and nearly sixty plates.

OSBORN and BALL.—“Studies of North American Jassoidea,” 1897. ‘Proceedings’ of the Davenport Academy of Natural Sciences, vii. pp. 45-100, pls. i.-vi. The North American and European Homopteral faunas have a great deal in common, and the British student cannot fail to profit by reading this valuable paper.

A FOSSIL HONEY-BEE.

By T. D. A. COCKERELL.

ABOUT thirty-seven fossil bees have been reported from the Tertiary strata of Europe, but many of these have been merely alluded to, without descriptions or specific names. Of the named species, one is from Corent, France, one from Krottensee, Bo-

hemia, eleven are from Eningen, Baden, one is from Orsberg, four (very imperfectly known) are from Prussian amber, three (two of them said to occur also at Eningen) are from Radoboj, Croatia, and four are from Rott, in Rhenish Prussia. The full bibliographical details will be found in Scudder's catalogue of fossil insects, Bulletin 71, U. S. Geological Survey.

Some of the Eningen species are well preserved, but the others are for the most part so imperfect as to be of wholly doubtful generic position. *Anthophorites gaudryi*, Oustalet, 1870, from Corent, has a curiously fly-like appearance, according to the figure, and, since its hairs are not plumose, it is presumably not a bee. Its wings are not preserved, except a small portion of the base.

The species from Rott, all described by Heyden (1859 and 1862), have been assigned to *Anthophora*, *Apis*, *Bombus*, and *Osmia*. I found in the Museum of Comparative Zoology at Harvard University a series of specimens from Rott, received years ago from Dr. Krantz. They are labelled *Apis dormitans*, *Anthophora effossa*, and *Osmia carbonum*; but it is evident that they were not part of Heyden's material, as they do not agree with his figures and descriptions. The "*Anthophora effossa*," in fact, is an ant, about 5 mm. long. The "*Apis dormitans*" is represented by two specimens, with the venation partially preserved. One is about 15 mm. long, stout-bodied, with the hind margins of the abdominal segments broadly pale, and the hind basitarsus broadened. What can be seen of the venation, of both anterior and posterior wings, will do for true *Apis*, except that the basal nervure almost meets the transverso-medial, only just falling short of it. The transverso-medial of the hind wings is scarcely oblique, thus resembling more that of *A. florea*, Fabr., than that of *A. mellifera*, L., or *A. dorsata*, Fabr. The approximation of the basal nervure to the transverso-medial agrees with the living genus *Melipona*.

The second "*Apis dormitans*" has dark spots at the sides of the abdominal segments, and the basal nervure seems straighter. It appears to be congeneric with the first, but possibly not conspecific.

That these bees are the genuine *A. dormitans* certainly cannot be affirmed. The original figure of that species shows venation which cannot possibly be reconciled with them, even allowing for bad drawing; the size also seems too small.

"*Osmia carbonum*" is represented by a very good specimen, with reverse; and an example of a quite different, much smaller, species, the venation of which cannot be seen. The original *O. carbonum*, as also the original *Anthophora effossa*, was without any visible wings.

The other specimen, with reverse, is evidently congeneric, at least, with the specimens of "*Apis dormitans*." It is undoubtedly

very close to the modern genus *Apis*; separable subgenerically, perhaps, because the basal nervure meets, or almost meets, the transverso-medial, as in *Melipona*. As there is no reason to suppose that it has anything to do with *Osmia carbonum* (which, in any event, is indeterminate), and since it cannot be reconciled with *A. dormitans*, it may be described as follows:—

Apis (*Synapis*, subg. nov.) *henshawii*, sp. nov.

♂. Length 15 or 16 mm.; vertex with long erect black hair, as in *A. mellifera*; this hair appears to be plumose; mandibles toothless, obliquely truncate, quite as in modern *Apis*; mesothorax bare; antennæ normal; tongue long, normal; abdomen banded; claws bifid, the inner tooth short, as in modern *Apis*; pulvillus well-developed; sting visible; venation as in modern *Apis*, except that the basal nervure almost meets the transverso-medial, and the upper side of the second submarginal cell seems shorter; the long marginal cell, with rounded apex, the peculiar submarginals, the basal with its lower section much the longest, &c., are plainly visible, but unfortunately the termination of the second recurrent nervure cannot be seen.

The insect is named after Mr. Samuel Henshaw, of the Museum of Comparative Zoology.

The Museum of Comparative Zoology also contains an example of *Anthophorites mellona*, Heer, from Öeningen, determined by Heer himself. It is stout-bodied, 17 or 18 mm. long, abdomen apparently banded; hind tibia visible, and shaped as in *Apis*. The venation cannot be seen, but a large part of it was visible in Heer's original type, as his figure shows.

TWO NEW SPECIES OF AGATHINÆ (BRACONIDÆ) FROM BORNEO.

By P. CAMERON.

Euagathis leptopterus, sp. nov.

Luteous; the flagellum of antennæ and the hind tarsi fuscous. Wings, including the costa, stigma, and nervures, bright luteous, except for a blackish spot, longer than wide and of equal width, behind the parastigma, the body and legs densely covered with a short pale pubescence. ♀. Length 10 mm.

Wings long, narrow; the areolet 4-angled, narrowed in front; the lower part of the second transverse cubital nervure narrowed and sloped towards the base of the cellule. Malar space a little shorter than the eyes. Parapsidal furrows distinct, but neither wide nor deep. Basal slope of scutellum broadly margined above; behind it are two rows of distinct punctures, the apex rounded, margined by a stout keel. Post-scutellum wider than long, of equal width; the lateral keels stout; a stout keel runs from the middle of the apical one. On the base of the metanotum, in the centre, are three areæ,

all longer than wide; the central is slightly narrowed towards the base, and has a stout transverse keel near the middle; the lateral is widened at the base; the apex is rounded and longer on the outer than the inner side. Mesopleuræ above the stoutly crenulated furrow smooth; below it closely punctured, as is also the sternum. Abdomen smooth, hardly so long as the thorax; the ovipositor short.

Kuching, Borneo.

Allied to *E. borneoensis*, Szép., which may be known by the black legs. The species is an exact mimic of *Iphiaulax leptopterus*, Cam., also from Sarawak.

Cremnops satapensis, sp. nov.

Black; covered with short black pubescence; the four tibiæ dark testaceous in front, their tarsi rufo-testaceous; wings black to the base of the stigma, milky-white beyond, the stigma, except at the base and apical nervures, pale testaceous; the areolet almost square; the second transverse, cubital nervure slightly rounded, narrowed behind.

♀. Length 9 mm.; ovipositor 7 mm.

Satap, Borneo. September (John Hewitt).

Malar space longer than the eyes. Palpi testaceous. Scutellar depression deep, large, with three stout keels in the middle. The central area of metanotum extends to the apex, is narrower than the lateral, and has two keels above the middle; its outer keels curve outwardly at the top; there are two lateral areæ, the upper wider and longer than the apical. There is a curved row of foveæ on the base of the mesopleuræ, commencing shortly above the middle; the upper long, narrow, shallow; the two apical shorter, wider, and much deeper, and they reach to the apex, which is bounded by a widely crenulated furrow. Abdomen smooth; the second segment with a distinct curved, transverse furrow beyond the middle; the basal ventral segment is for the greater part white.

This species has the coloration of *Iphiaulax pheres*, Cam., also from Kuching. Along with it Mr. Hewitt sends a Dipteron of exactly the same coloration and size.

CURRENT NOTES (NEW SERIES).

By G. W. KIRKALDY.

(Continued from p. 206.)

1. BAU, A.: "Diptera Fam. Muscaridæ, Subfam. (Estrinæ)," Gen. Ins. fasc. 43, pp. 1-31, (col.) pls. 1-2 (1906).
2. BRUES, C. T.: "Diptera Fam. Phoridæ," *op. cit.* 44, pp. 1-21, (col.) pls. 1-2 (1906).
3. BERLESE, A.: "Sopra una anomalia negli organi sessuali esterni femminei di *Locusta viridissima*, L.," *Redia* iii. 305-14, figs. 1-7 (July 14th, 1906). Orthoptera.

4. BANKS, C. S.: "Problems in Economic Entomology in the Philippines." *Philippine J. Sci.* i. 1067-74 (December, 1906).
5. BUYSSON, R. DU: "Monographie des Vespides du genre *Nectarina*," *A. S. E. France*, lxxiv. 537-66, pls. 11-16 (December, 1905). Hymenoptera.
6. DUPUY, G.: "Sur la date d'éclosion de *Smerinthus tilia*," *B. S. E. France*, 1906, pp. 218-9. Lepidoptera.
7. DYAR, H. G., and KNAB, F.: "On the Classification of the Mosquitoes," *Canad. Ent.* xxxix. 47-50 (February 14th, 1907).
8. FEDERLEY, H.: "Den experimentella lepidopterologin och dess historia," *Ent. Tidskr.* xxvii. 143-57 (December 29th, 1906).
9. FERTON, C.: "Notes détachées sur l'instinct des Hyménoptères mellifères et ravisseurs" (third series), *A. S. E. France*, lxxiv. 56-104, pls. 3-4 (July, 1905).
10. HORVÁTH, G.: "Synopsis Tingitidarum regionis palæarcticæ," *Ann. Mus. Hung.* iv. 1-118, 1 col. pl. and 4 text-figs. (1906). Hemiptera.
11. JONES, B. J.: "Catalogue of the Ephydridæ [of the world], with Bibliography and Descriptions of New Species," *Techn. Bull. Univ. California Ent.* i. 153-98, pl. 1 [two views] (October, 1906). Diptera.
12. JEANNEL, R.: "Note sur une anomalie antennaire observée chez *Carabus splendens*, Fabr.," *B. S. E. France*, 1905, pp. 143-4, 1 fig. Coleoptera.
13. LIE-PETTERSEN, O. J.: "Zur Kenntniss der Apterygotenfauna des nördlichen Norwegens," *Tromsø Mus. Aarsh.* xxviii. 51-76, pl. 1 (December 1st, 1906). Thysanura and Coleoptera.
14. LESNE, P.: "Notes sur les mœurs et sur l'habitat du *Platyparea pœcilopectera* schrank et de l'*Agromyza* de l'Asperge," *Bull. S. E. France*, 1905, pp. 12-13, fig. 1. Diptera.
15. LAMPA, S.: "Berättelse till K. Landtbruksstyrelsen angående verksamheten vid statens entomologiska anstalt under år 1905," *Ent. Tidskr.* xxvii. 17-64 (July 21st, 1906).
16. ID.: "Rönnbärsmalen (*Argyresthia conjugella*, Zell.)," *op. cit.* 1-16, pl. 1 (July 21st, 1906). Lepidoptera and Hymenoptera.
17. MUCHHARDT, H.: "Bidrag till Kännedomen om Sveriges Hemiptera och deras utbredning inom landet," *op. cit.* 125-38.
18. METCALF, M. M.: "An Outline of the Theory of Organic Evolution," ed. 2 (London and New York), i-xxii and 1-212, pls. 1-101 (18 col.), text-figs. 1-46 (1906) [first edition, 1904].

19. PHISALIX, C.: "Sur la présence de venin dans les œufs d'Abeilles," B. S. E. France, 1905, 201-3. Hymenoptera.
20. OBERTHÜR, C.: "Variations de Lépidoptères," *op. cit.* 55-9.
21. PIC, M.: "Sur *Crioceris asparagi*, L., et ses variétés," *op. cit.* 1906, pp. 119-23. Coleoptera.
22. PICARD, F.: "Sur les changements de coloration chez les mâles de quelques Libellulides," *op. cit.* 166-7. Odonata.
23. ROYER, M.: "Synonymie du *Tricéphora sanguinolenta*, Scop., et de deux espèces voisines," *op. cit.* 297-8 (1907). Hemiptera-Homoptera.
24. ID.: "A propos d'*Elasmostethus minor*, Horv.," *op. cit.* 287-8, figs. 1-4 (1907). Hemiptera.
25. SILVESTRI, F.: "Note sur Machilidæ," *op. cit.* 325-40, figs. 1-15 (August 18th, 1906). Thysanura.
26. ID.: "Contribuzione alla conoscenza dei Termitidi e Termitofili dell' Eritrea," *op. cit.* 341-59, figs. 1-22 (September 28th, 1906). Coleoptera, Neuroptera, Diptera.
27. SCHNEIDER, J. S.: "Saltdalens Lepidopterfauna 2det bidrag," Tromsø Mus. Aarsh. xxviii. 103-62 (February 26th, 1907).
28. TULLGREN, A.: "Intryckforån en praktiskt-entomologisk studiereresä i utlandet, sommaren 1906," Ent. Tidskr. xxvii. 159-81 (December 29th, 1906).
29. WAHLGREN, E.: "Svensk insektfauna. 1. Första ordningen. Borstvangsar och Hoppstjärtar. Apterygogenea," *op. cit.* 233-70, figs. 1-30 (December 29th, 1906).
30. PERKINS, R. C. L.: "Parasites of Leaf-hoppers." KIRKALDY, G. W.: "Leaf-hoppers," Bull. Exp. Sta. H. S. P. A. iv. 1-66 (May 1st, 1907). Hymenoptera and Hemiptera.

Metcalf's work is drawn largely from entomological sources (18). Lampa's Report on the Work of the Entomological Division of the Swedish Agricultural Station for 1905 contains brief notes on a number of more or less noxious Swedish insects, most of which are also British (15).

Tullgren publishes his impressions of the economic work done at Copenhagen, Hamburg, Wageningen, Geissenheim, Vienna, Budapest, Halle, and Berlin (28).

Silvestri continues his researches on Machilidæ, and promises a monograph. Incidentally he gives a synoptic table of the palæarctic species of *Machilis* (25). Wahlgren (29) synthesizes the Thysanura and Collembola of Sweden in a paper which will be useful to British workers, while Lie-Pettersen (13) contributes to our knowledge of these forms in Northern Norway.

Berlese describes and discusses the morphology and anatomy of a Locustid with two ovipositors (3).

Horváth has monographed the palæarctic Tingidæ, with tables of genera and species, and references to food-plants. The coloured plate is one of Fieber's, unpublished for about forty

years (10). Muchhardt briefly notes fifteen Swedish Heteroptera, most of which occur also in Britain; information on food-plants and localities is afforded (17).

Royer has shown (23) that there is some confusion in the names given to three of the commoner European *Tomaspis*, the name "*sanguinolenta*, Linné" being later than "*sanguinolenta*, Scopoli." The correct synonymy he gives as follows:—

(1) *sanguinolenta*, Scopoli, 1763 = *mactata*, Germ., 1821 = *distinguenda*, Kirschb., 1868, &c.

(2) *sanguinea*, Geoffroy, 1785 = *vulnerata*, Germar, 1821, &c.

(3) *intermedia*, Kirschbaum, 1868 = *obliterata*, Kirschb., 1868 = *sanguinolenta*, Linné (pt.), 1766.

"*Sanguinea*," however, was preoccupied in *Cicada* before 1763, so that we can still call the British species *Tomaspis vulnerata*.

The recent addition (24) to the French hemipterous fauna of *Elasmotethus minor*, a Cimicid up till recently confused with *E. interstinctus* (Linn.),* makes it possible that the former is to be found in the British Isles. The food-plant is, it is true, an introduced plant, now, however, thoroughly established, and the bug should be looked for either on this or on its congener, the honeysuckle. The differences between the two forms may be stated as follows:—

	INTERSTINCTUS.	MINOR.
♂. Second genital segment.	With a small black spine at the side posteriorly.	Not spinose.
♀. Genital segment.	Truncate apically in the middle.	A little emarginate apically in the middle.
Angle formed by the meeting of this and of the last tergite.	Obtuse.	Acute.
Food-plants.	<i>Betula alba</i> , <i>Salix</i> , <i>Populus</i> .	<i>Lonicera xylosteum</i> .

Jeannel records (12) a *Carabus* with the third segment of the right antenna trifid. This segment is flattened and dilated, wider apically than basally, giving rise to three segments at its apex, the two supplementary branches each being composed of

* *E. interstinctus* (Linn.) = *Acanthosoma dentatum* of Saunders's Hem. Het. Brit., and must not be confounded with *A. (E.) interstinctum* of the same work, which = *griseus* (Linn.).

two segments. Pic (21) discusses the varieties of the asparagus beetle.

Dupuy states that *Smerinthus tilie* is double-brooded in some parts of France (6).

Sparre Schneider has a lengthy list of Norwegian Lepidoptera (27), with a full discussion.

Federley gives a *résumé* of the temperature experiments on Lepidoptera of Weissmann, Merrifield, Standfuss, and others (8). Lampa discusses the metamorphoses and habits of *Argyresthia conjugella*, which, in Sweden as in Britain, feeds on rowan berries (*Pyrus aucuparia*). He also deals with *Carpocapsa pomonella*, and the sawfly, *Hoplocampa testudinea*, on apple, though the two last are not indicated in the title. The paper is illustrated by a coloured plate (16). Oberthür has brief notes on certain varieties of *Chrysophanus phleas*, *Abraxas grossulariata*, &c. (20).

Picard (22) states that the males of those dragonflies which are different in coloration from their females are not so at their emergence from the nymph or for some days after; this seems to be due to the fact that spermatogenesis is not finished, as in most other insects, at the instant of emergence, but is delayed for some days.

Phisalix demonstrates the presence of venom in the eggs of bees, in the proportion of about the one hundred and fiftieth part of the weight of the egg. A young sparrow died two hours after inoculation from an injection of an emulsion resulting from the preparation of nine hundred and twenty-six bees' eggs (19).

Ferton continues his notes on the habits of Hymenoptera, dealing with *Osmia*, *Tachysphex*, *Gorytes*, *Pompilus*, *Chrysis*, &c. The plates principally show the insects attacked and the manner of attachment of the egg (9).

R. du Buysson has monographed Nectarina—a genus of social wasps inhabiting America only, not neglecting to summarize (in three and a half pages) their biology. Four of the six plates figure nests of various species (5).

Lesne has made notes on the habits of a Trypetid and of an Agromyzid attacking asparagus (14).

Bau and Brues have monographed the genera of certain Diptera (1 and 2); in the *Æstrinæ* twenty-one, and in the *Phoridae* twenty-three, genera are recognized.

All Theobald's subfamilies of Culicidæ are held by Dyar and Knab to be untenable, these authors finding only two, Culicinæ and Sabethinæ. The classification based on palpi is ruled out, the differences being of a secondary sexual nature, and sometimes variable within the limits of a single species. One new character is used, *i. e.*, a tibial comb, which is supposed to act as a cleansing organ for the body parts or wings (7).

Perkins (30) continues his researches on parasites of leafhoppers, summarizing his observations.

NOTES AND OBSERVATIONS.

MALE LASIOCAMPA QUERCUS ATTRACTED BY (?) ODonestis POTATORIA FEMALE.—On July 14th, in the neighbourhood of Abersoch, Carnarvonshire, I found a very much crippled moth, which, with some hesitation, I concluded was a female *Odonestis potatoria*. The wings were almost scaleless and very short. I put the specimen in an ordinary glass-bottomed pill-box, intending to try “sembling” in the evening on the sand-hills. My companion put the box in his pocket, and shortly afterwards, about 4 p.m., netted a moth which came persistently flying round him. This moth was a male *Lasiocampa quercus*. In the evening males of *O. potatoria* “sembled” freely. Several were boxed, and one paired with the crippled specimen, which undoubtedly was *O. potatoria*. Whether it attracted the male *L. quercus* in the afternoon, or whether it was merely a coincidence that the latter came flying round, I am unable to say, but am inclined to think it came on a false scent. I may add that we had not been taking *L. quercus*, and none of our boxes had contained any female of this species during this season.—A. HARRISON; Delamere, S. Woodford.

RE-OCCURRENCE IN BRITAIN OF PYRALIS LIENIGIALIS, Z.—So far as I was aware last spring, the only captures of this species in Britain had been made by Messrs. J. Bryan and W. Thompson, who secured several specimens near Stony Stratford, Bucks, in and about the year 1880, as recorded by the latter gentleman in Entom. xiv. 84–85 (1881), and also in Ent. Mo. Mag. xvii. 256 (1881). It was, therefore, with special pleasure and interest that, on May 29th last, whilst glancing through the collection of Lepidoptera formed by Mr. Vernon P. Kitchen, just prior to its dispersal by auction at Mr. Stevens’ rooms, I caught sight of a specimen of *Pyrallis lienigialis*, Z., standing in the series of *P. farinalis*, L. Fortunately for me it apparently escaped the notice of others, and the Lot in which it was included became my property at a nominal figure. The individual in question was labelled “Haddenham,” and further information, kindly supplied by Mr. Kitchen, shows that it was taken by him at Haddenham, Bucks, in 1903. It is a curious coincidence that the only two ascertained British localities for this scarce insect (whose life-history is, I believe, still altogether unknown), although lying rather over twenty miles apart “as the crow flies,” and very near the boundary-line of the county, happen to be both situated in Buckinghamshire.—EUSTACE R. BANKES; Norden, Corfe Castle, August 19th, 1907.

ON THE DISCOVERY OF THE FOOD-PLANT OF ACIPTILIA (BUCKLERIA) PALUDUM, Zell.—In the course of his kind references to myself in his interesting note under the above heading (*antea*, pp. 187–8), the Rev. O. P. Cambridge says, “There remained, however, one plant—the sundew (*Drosera*)—whose likelihood to be the true one certainly never crossed our minds; though Mr. Bankes tells me that it did occur to him some few years ago, but only to be dismissed at the time as an untenable idea.” The matter is now of very secondary importance, but since I am unable to accept this last clause as accurate, Mr. Cambridge will, I feel sure, forgive me for mentioning that he must have misunderstood some of my remarks to him on the point, as is proved

by my statement that was published in Mr. Tutt's Nat. Hist. Brit. Lep. v. 497 (1906). It runs as follows:—"Although *Drosera rotundifolia*, from its well-known peculiarities of structure, &c., and carnivorous habits, seemed so unlikely to be the food-plant of *Buckleria paludum*, I had suspected, ever since 1890, that it might be so, from having then noted it as apparently the only possible food-plant which was common to the spots known to me for the insect. A thorough search, however, on this and other plants, in 1891 and subsequent years, produced no result, doubtless owing to the great abundance of *Drosera* and the scarcity of the larva." It is obvious that, if my suspicion that *Drosera* was the food-plant had been "dismissed at the time as untenable," I should not have taken the first opportunity, after it had been aroused, of thoroughly searching that plant in the hope of finding the larva, and have renewed the search thereon in other years.—EUSTACE R. BANKES; Norden, Corfe Castle, August 26th, 1907.

INCREASE OF BUTTERFLIES IN MAURITIUS: A CORRECTION.—In the June number of the 'Entomologist,' Captain Tulloch, when writing on the above subject, refers to a letter of mine, in which I had stated that I had captured *Zizera maha* in Mauritius. The insect was not as I supposed, *Z. maha*, but *Z. autanossa*, Mabille. My excuse must be that, at the time, I had no collection or books to refer to, and was speaking from my recollection of *Z. maha*. The point of the correction, however, lies in the fact that *Z. maha* does not occur in the Ethiopian region, and its reported capture in Mauritius might lead to the faulty inference that Mauritius, so far as its butterfly fauna is concerned, had some connection with the Oriental region.—N. MANDERS, Lieut.-Col. R.A.M.C.; Glastonbury Abbey, August 23rd.

NOTES ON *LYCÆNA ARGIADES*, Pall.—Under the above heading, in the number of the 'Entomologist' for September, 1907, Mr. N. O. Rothschild (p. 201) says he "should be interested to know to which form the few known British examples of *L. argiades* belong"! These forms are detailed and discussed in the previous portion of his paper. As I possess two out of, as I believe, the only three authenticated British specimens of this insect, perhaps it will be sufficient for Mr. Rothschild's purpose if I offer the following remarks on my two specimens. The male has two orange spots beneath the hinder extremity of each hind wing. The female (almost entirely black above) has a small dull orange spot (in connection with a small black one) just above the base of the little tail on the upper side of each hind wing. The third British example I have alluded to was taken at Bournemouth on August 21st, 1885, by a Mr. Tudor, then a pupil at the "Forest School," Walthamstow. This specimen was thus captured practically at the same time as the two on which I have given the above information, and subsequently I examined it myself in Mr. Tudor's collection at the Forest School. The only other examples, so far as I am aware, that have laid any claim to British origin are two (both males) recorded by the Rev. J. S. St. John in the November number of the 'Entomologist,' 1885. I had some correspondence with Mr. St. John on the subject of these two specimens, the result of which was my conviction that their origin was Continental, not British. They passed out of Mr. St. John's possession, and subse-

quently came into the auction-room, in London, where, as I was informed by several entomological friends, there was very little faith in them as genuinely British specimens. They were purchased, however, by the late Mr. C. W. Dale, and are now in that gentleman's collection, in the University Museum, Oxford. For a description and figures of my two specimens, see Proc. Dors. N. H. & A. F. Club, vol. vii., 1886, p. 79, pl. v.—O. PICKARD-CAMBRIDGE; September 7th, 1907.

CAPTURES AND FIELD REPORTS.

MYELOPHILA CRIBRUM IN SURREY.—This species is not uncommon now in this district. I first met with it (in the larva state) three years ago, when looking for the larva of another species, in dead thistle stems, and have found it sparingly each winter since. I did not meet with the imago until last year, when I noticed a single specimen in the garden; but in July last I noticed quite a dozen when crossing a field near here which has not been cultivated for three years, and is now overgrown with rough herbage. They were sitting singly and in pairs on the leaves of their favourite food-plant (*Carduus lanceolatus*). I have found the larva at Sutton, so that it appears to be working across the county in a westerly direction. I am strongly of opinion that it has reached this part of the county very recently from Kent. Mr. W. R. Jeffrey (Ent. Mo. Mag. xli. 235) recorded its occurrence near Ashford and eleven miles west of that town, and suggested that it might have reached Surrey, which is undoubtedly the case.—A. THURNALL; Thornton Heath.

With reference to your note on the occurrence of *Myelophila cribrum* in Surrey, I may state that I took three specimens at light on Tooting Common on the 1st July, 1905.—JOHN ALDERSON.

I captured two specimens of *M. cribrum* at light here on July 3rd last.—PERCY RICHARDS; Queen's Road, Kingston Hill.

LEUCANIA UNIPUNCTA IN DEVON.—On September 7th my father took a perfect specimen (bred condition) of *Leucania unipuncta (extranea)* on sugar at Paignton.—P. P. MILMAN; Cyprina, Paignton, Devon.

SPHINX CONVULVULI IN DURHAM.—I beg to report that a specimen of *S. convulvuli*, in moderate condition, was taken at rest in his garden here by Mr. J. Taylor on the 17th inst. I believe that this is the first time this fine insect has been taken in this city.—T. MADDISON, F.E.S.; South Bailey, Durham.

SIREX GIGAS IN WILTSHIRE.—A fortnight ago a friend of mine captured a specimen of the above insect at Woodford, near here, and brought it to me alive. I have only just succeeded in identifying it. Possibly the capture may be of interest.—W. A. BOGUE; Wilts and Dorset Banking Company, Limited, Salisbury, September 9th, 1907.

HELIOTHIS PELTIGERA IN SOUTH DEVON.—In this uncanny season it may be of interest to record the finding of *H. peltigera* larvæ, and that the moths are now emerging. I took six during the second week in August in South Devon; these went to ground in a few days, and

to-day (September 3rd) the first moth emerged. Is not this period of pupation unusually short, seeing that pupæ were only under the influence of ordinary kitchen temperature and by no means hardly forced?—LESLIE BURT; Broadley, Coedeanas, Begelly, R.S.O., Pembrokeshire, September 3rd, 1907.

COLLECTING ON THE LINCOLNSHIRE COAST.—Between the Humber and the Wash there extends a stretch of coast line of slightly convex outline and similar in character along its length. About the centre is placed the village of Sutton-on-Sea, a place unknown to me before the present year and possibly new to some of my brother entomologists, so that a few notes thereon may be of interest. I spent two short periods there, between August 6th and August 20th, and during that time it rained every day. This, I believe, is unusual, for the district is noted for dry bracing air and sunshine. The place is easily described. The shore, which is of great extent at low tide, consists of very firm sand, interspersed with patches of hard, slippery mud. Next the shore is a range of high sand-hills, averaging fifty feet high, with a width of, perhaps, seventy yards at their base, bare on the side next the sea and covered with growth on the land side. Behind the dunes flat fen-land stretches for several miles, but some slight undulations are to be found, and hills can be seen in the distance some eight miles away. The growth on the dunes is mainly couch grass, with some marram, false oat, and other grasses, ragwort, knapweed, hounds'-tongue, thistles, burdock, and other weeds, as well as large areas of elder and sea-buckthorn. The land behind the dunes is mostly arable, but there is some pasture, and many water-weeds and rushes grow in the dykes that separate the fields and in the hollows that have been dug for clay. The weather prohibited much work in the daytime, for the winds were strong and the sky mostly cloudy. Butterflies were naturally few, and those seen comprised *Pieris rapæ*, *P. napi*, *Vanessa urticæ*, *Epiniphela ianira*, *E. tithonus*, and *Chrysophanus phleas*. *Porthesia similis* and *Leucoma salicis* were common enough. *Bryophila perla* was to be found on the walls, and *Eubolia limitata* was in fair condition. On sugar in the evenings there was no lack of insects. They arrived early, as soon as the mixture was put on; they stayed late; they fought persistently, and were hardly to be driven away. Most noticeable among them was *Xylophasia monoglyphæ*. It simply swarmed; its ferocity was wonderful to see, and it showed a fine variation from the lightest to the darkest forms. The next plentiful insect, perhaps, was *Miana literosa*, but *M. bicoloria*, *Triphæna pronuba*, *T. comes*, *Xylophasia lithoxylea*, *Leucania pallens*, *L. impura*, *L. lithargyria*, *Apamea didyma*, *Agrotis exclamationis*, *A. nigricans*, *A. tritici*, *Noctua c-nigrum*, and *Hadena oleracea* were in some numbers, accompanied by a few *Acronycta psi*, *Calamia phragmitidis*, *Cerigo matura*, *Mamestra brassicæ*, *Caradrina alsines*, *Agrotis vestigalis*, and *Acidalia dimidiata*. *Luperina testacea* came to light but not to sugar. Possibly a longer list could have been made from insects on sugar but for the aggressiveness of *X. monoglyphæ*. That is, I fear, an oft-repeated tale, but I have never seen it so well merited as in this instance.—B. W. ADKIN; Trenoweth, 8, Hope Park, Bromley, Kent.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 25th.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Newman exhibited a long bred series of *Arctia villica* from larvæ collected in North Kent, and including a number of asymmetrical forms with aberrant markings.—Mr. R. Adkin, the coleopteron *Anobium panaceum*, which had been found destructive to sample packets of tobacco.—Mr. Sich, a specimen of *Tortrix pronubana*, taken in his garden at Chiswick.—Mr. South, a short series of *Abraxas sylvata*, including some curiously clouded forms.—Mr. West (Greenwich), three rare species of Hemiptera from the New Forest, *Eyscorus æneus*, *Corixus maculatus*, and *Lopus gothicus*.—Mr. Step, photographs of Lepidoptera at rest, taken during the field-meeting of the Society at Box Hill.—Mr. Clark, an unusually pink form of *Amorpha populi*.

August 8th.—President in the chair.—Mr. South exhibited a hybrid specimen of *Malacosoma*, *M. castrensis* × *M. neustria*, and read notes.—Mr. Montgomery, a bred specimen of *Toxocampa craccæ* from North Cornwall.—Mr. Newman, an exceptionally pink form of *Saturnia carpini*, a very dark form of *Smerinthus ocellatus*, a dark bred *Arctia caja*, living larvæ of *Ennomos autumnaria* from Dover, and a cocoon of *Anthrocera filipendulæ*, from which the pupa had been extracted by birds.—Mr. Goulton, a female of the sawfly, *Sirex gigas*, from Sutton.—Mr. Sich, the eggshells, mines, cocoon and imago of *Cemistoma laburnella* from Chiswick.

August 22nd.—President in the chair.—Mr. Harrison exhibited series of *Hyria muricata* (*auroraria*) from Wicken and the New Forest, and made remarks on the variation of the species.—Mr. Tonge, the living larva of *Saturnia pyri*, from Continental ova and larvæ of *Dipterygia scabriuscula* from ova laid by a female taken at Reigate.—Mr. Newman, a larva of *Dicranura bicuspis* from Tilgate Forest, and pointed out the difference from *D. bifida*.—Mr. Turner, specimens from West Australia, including (1) *Delias aganippe*; a brilliant Pierid—*Apina callisto*; a Noctuid moth—*Lycænesthes inous*; the Pyrale *Mecyna polygonalis*; and the two Tineids, *Cryptolechia alveola* and *Tinea clathrata*. (2) Three cases of a large species of Psychid, *Eceticus* sp.?, made of short twigs, with a number of parasites of the genus *Bassus*, which had emerged from one case. (3) Examples of the *Coccus*, males, called the “Paradise fly.” (4) A series of the males of the Lamellicorn beetle *Rhipidocera femorata*, with beautifully developed antennæ. (5) A specimen of *Helæus femoratus*, a Tenebrionid with curiously developed margins to the thorax and elytra; and (6) a *Gordius* worm extracted from the abdomen of an *Erebia ligea*, taken on the Rigi, Switzerland, on August 29th.—Mr. Moore, numerous species of Lepidoptera taken during a short trip to Wimereux, and read notes on the exhibit, which included *Anthrocera trifolii*, *Melanargia galatea*, and *A. meliloti*.—Dr. Chapman, a specimen of *Lycæna eumedon* from Gavarnie, Pyrenees, apparently an extreme form of the ab. *subradiata*; and a specimen of *L. argus* (*ægon*) with unusually well-marked spot variation on the under side.—Mr. Rayward, living larvæ of *Cucullia lychnitis*, and remarked on a curious colour difference between larvæ captured and those from ova in captivity.—Mr. Turner, larvæ of *C. verbasci* and *C. lychnitis*, and pointed out the difference in markings. He also showed a specimen of the large

mud-wasp, *Sceliphron latus*, with its nest, from West Australia.—Mr. R. Adkin exhibited specimens of *Eupithecia dodoneata* from Eastbourne, taken on the cliffs, and, commenting on their occurrence so far from the nearest oak-trees, suggested that their food-plant had been the evergreen oak, which grew somewhat near where they were taken; he also showed a series of *E. oblongata*, bred from flower-heads of *Centaurea* at Eastbourne.—Mr. Sich, cases of *Coleophora albicosta*, found on a furze-bush in Surrey; and also the larvæ of *Pararge mæra* from ova, and feeding on *Poa annua*, but only in the early morning and in the evening.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*July 1st, 1907.*—Mr. R. S. Searle in the chair.—Mr. Hubert Langley reported finding *Stauropus fagi* in Princethorpe Woods, near Leamington, on June 15th and 22nd last. This was the first certain record in the county. Also at the same place, *Larentia silaceata*, *Boarmia roboraria*, and *Lymantria monacha*. He also showed males of *Dasychira pudibunda*, taken on the wing one night in the same wood, and said that on that night they were quite common.—Mr. R. S. Searle showed bred *Chærocampa elpenor* from Wicken, together with a hymenopterous parasite from same, probably *Protichneumon laminatorius*.—Mr. J. T. Fountain, another ichneumon which he had bred, also from *elpenor*, one of the large red species; Mr. Fountain showed also a bred series of *Angerona prunaria*, including all its forms.—Mr. Langley, a number of cocoons of a hymenopterous parasite bred from larvæ of *Geometra papilionaria*.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*September 3rd, 1907.*—Mr. A. J. Wightman, of Lewes, was elected a member of the Society.—Mr. S. J. Bell exhibited *Zygæna trifolii-major* from North Cornwall, end of July, 1907; in most of the specimens the spots were more or less confluent, while in one instance they were merged into one large blotch occupying two-thirds of the wing area.—Rev. C. R. N. Burrows, larvæ of *Hemithea thymiaria*, feeding on thyme; also *Orthosia upsilon* ab. *nigrescens* (Tutt), *Grammesia trilinea* ab. *obscura* (Tutt), and *Xylophasia monoglypha* ab. *infusata* (White), all from Mucking.—Mr. J. A. Clark, *Dryas paphia* reared from *valezina* ova; of twelve specimens bred five were *valezina*.—Mr. H. M. Edelsten, *Zygæna trifolii-major* from Norfolk Broad, late July, 1907, mostly with confluent central spots.—Mr. T. H. L. Grosvenor, larvæ and pupæ of *Nemeobia lucina* reared from ova laid by a West Horsley female.—Dr. G. G. C. Hodgson, a long series of *Spilodes palealis* taken at Dover between July 24th and August 3rd, 1907; also *Polyommatus phleas* var. *intermedia* from Reigate, and *Chærocampa porcellus* with right wings of normal southern coloration and left wings of almost unicolorous yellowish shade often seen in northern specimens.—Mr. C. P. Pickett, a yellow *Callimorpha dominula* from Deal, and *Lycæna alexis* ab. *obsoleta* from Clandon.—Mr. J. Riches, *Abraxas grossulariata* from North London, with wings thickly "powdered" with black scales.—S. J. BELL, *Hon. Sec.*

ON THE REARING OF PAPILIO PODALIRIUS.—The name of the writer of the note on this subject (*ante*, p. 211), there omitted, is Francis T. Gilliat, Forest Dene, Worth, Sussex.



Ova of *Rastacus cephyrus* var. *lycidas* $\times 10$
(Bérissal).



Ova of *Lygea alcon* $\times 10$
(Bism).

A. E. Tonge photo.

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NOTES ON A SUMMER TOUR IN SWITZERLAND.

By H. ROWLAND-BROWN, M.A., F.E.S.

(PLATE V.)

IN a short paper dealing with a tour in Southern France this May (*antea*, p. 149), I had good reason to deplore the continual overcast weather which militated so strongly against success with the butterflies of that region, and also the lateness of all such species as actually were observed. I regret to say that I must take up the parable again with much the same comment, for though in Switzerland the weather from the middle of July onward to the middle of August was as a rule sunny and warm, the effects of a cold cloudy spring, continued right through to the very eve of my arrival, told disastrously on the "bag" which in an ordinary Swiss season should be large in comparison with the more select captures of less well-known and ably worked localities. It is nine years since I wandered in the Alps of Switzerland, and great have been the changes in the interval. Generally speaking, the whole aspect of the country has altered. Numerous hotels have sprung up; the remoter valleys are seamed with narrow-gauge railways; the Jungfrau line nears completion, and another is already contemplated which shall bring the Matterhorn in reach of the ordinary tourist. Entomologically a great deal has been added to our knowledge of the Lepidoptera. An industrious entomological society has come into being in Geneva; a sound handbook for British collectors—Mr. George Wheeler's—has been published, and several resident Englishmen, as well as many summer visitors, have concentrated their attention not only on butterfly-hunting as a pastime, but upon the interesting problems presented by the rich Alpine fauna, and the earlier stages of many species which were practically unknown to contemporary writers.

Remembering the abundance of butterflies in the early nineties, and anticipating something of the same kind to fill up

the blanks and renew the battered series of those years in my cabinet, I was hardly prepared for the disappointments of the summer of 1907. However, this fact is clear in my experience that even in a bad year, compared with other countries visited, Switzerland easily maintains supremacy in the matter of mere numbers. The old Simplon Road, now happily deserted by a great part of its travellers, who prefer the half-hour tunnel to the nine hours' diligence route from Brigue to Domodossola, seemed prolific enough as far as Berisal. A two days' expedition to Éclépens, while introducing me to a new Switzerland, discovered a sufficiency which I should have reckoned rich had I not been told that the scarcity of butterflies there was phenomenal; and this by the tried collectors who have worked the locality, of whom I was fortunate enough to encounter on the spot, the Rev. F. E. Lowe and Mr. G. O. Sloper.

Éclépens lies midway between Vallorbes and Lausanne, and may be reached from either, detraining in the first case at Le Sarraz, or at the station which bears its name, on the Yverdon-Lausanne Railway. Mr. Lowe and Mr. Wheeler have given elsewhere some account of its treasures in a good year. As far as *species* go, I found most of the things mentioned by them; and Mr. Reed, of Tunbridge Wells, had apparently been more fortunate with those I overlooked. Low wooded hills—oak and poplar—offer fine cover for the Apaturids. In the open ground a fine thickly scaled creamy form of *Parnassius apollo* (= var. *pseudonomion*, Christ.) was making its appearance on July 13th, where also on the lower bushes of blackthorn and privet *Thecla pruni* and *T. ilicis* occurred singly. In the glades *Limenitis sibylla* was not uncommon; and here also, for the first time, I found *Pararge achine* in good order and frequent. Following Mr. Wheeler's directions, I wound up a short day's work with a visit to the marsh on the Sarraz Road. But it was this year practically drawn blank, only a few *Melitæa dictynna* falling under observation, though I did capture one or two *Lycæna arcas*, but these far too worn to require a box. All my time this day was spent on the left-hand side of the railroad from Lausanne to Yverdon; on the 14th I devoted my attention entirely to the woodlands and hills on the right, and with considerably better results. Leaving Éclépens Station, a field road diverges from the main about a quarter of a mile to the east, leading up the hill, then through some promising copse-land, and past a large farmhouse, skirting the forest which is famous for its "Emperors." *L. sibylla* and *P. achine* were again to the fore, with *Euvanessa polychloros* freshly emerged; while far out of reach as yet soared *Apatura iris* in company with *A. ilia*. However, where a tiny brook had splashed the path and made congenial mire, I was soon brought to closer quarters with these splendid butterflies. Here *ilia* predominated, and the only one

of its several named varieties and aberrations I took was a single female, which I refer to Staudinger's ab. *astasioides*; and here also I took on the way back the only female *iris* seen. The road now winds up through the trees, and there Mr. Reed had captured *L. populi* a day or so before. But it was not until I reached the top of the hill and struck along the Lausanne Road that I found *iris* and *ilia* in any quantity. Unfortunately nearly all were worn; but from the droppings, which proved an irresistible bait for their majesties, I managed to net a few good examples. The temerity of these individuals was amusing and somewhat trying, for, after capture and rejection, I kept taking the veterans again and again. And once settled to their banquet, they might have been caught with the fingers! There were, however, no females here at all events, and but few other butterflies, except *Aphantopus hyperanthus*, occasional *Thecla ilicis*, and *Adopæa thaumas*, in the likely looking wastes by the roadside. Of the few day-flying moths noticed, *Lasiocampa quercus* and *Anthrocera loniceræ* may be mentioned. But the afternoon closed in with cloud and more wind, and early next morning I was on my way in the Simplon express to Brigue and the Upper Rhone Valley.

I certainly thought the proverbial bad luck of old years, which has attended my Swiss expeditions in the way of weather, was going to continue when I drove up to Berisal on the 15th from Brigue. The first half of the well-known drive, now perhaps less used than heretofore, and therefore so much the pleasanter for collecting, was performed under a blue sky. *Euvanessa polychloros* had already put in appearance at this comparatively high altitude, and males of *Epinephele lycaon* were flying with a very brilliant form of *Melitæa phœbe* long before I reached the famous "Second Refuge," where just ten years previously, in August, I had sought in vain for *Rusticus zephyrus* var. *lycidas*. Leaving the carriage to go on, I descended at this classic spot, but alas! the sky had clouded over, and scarcely anything was a-wing; just a few *R. argyrognomon*, Brgrstr., to raise false hopes, and kicked up from the herbs occasional *P. escheri*—afterwards found here in abundance with females, which I have usually missed or overlooked—and a scattering of *Melanargia galatea*. On this afternoon there were no *lycidas* on view, but the slopes affected by its favourite *Astralagus* bore all too eloquent testimony to the attentions bestowed on this pretty butterfly, which happily is by no means confined, as was once thought, to this particular locality in Switzerland. Had the manœuvres already commenced, I should have said that a regiment of cavalry at least had pounded over the ground; but when on subsequent days I returned to the chase, I was fortunate to capture several really fine specimens, though I fancy the species had been out a fortnight at least when I arrived. On the

under side especially the males have a remarkable likeness to *escheri*, and I captured more than one of this fine "blue" under the delusion that I had secured its rarer congener. But the females are more distinctive on the upper side, with the several orange spots at the anal angle of the lower wings, and these were busy ovipositing on the *Astragalus*, though never common. Close by I noticed the only specimen of *Carcharodus lavateræ*, a male, encountered this year in Switzerland; while the Simplon Road, usually so prolific up to the Ganter Bridge before the hotel, was somewhat of a disappointment, so few and far between were the butterflies one looks for in this region. *Melitæa didyma* was just emerging; *M. dictynna* already well advanced; *Brenthis euphrosyne* generally common but worn, and belonging, I conclude, to the first brood. The larger fritillaries were for the time being conspicuous by their absence, and I continued to take insects which generally are well over, as to the first brood, by the first week in July—*Nisoniades tages*, *H. malvæ*, and *Euchloë cardamines*.

My first day on the mountains proper, the 16th, found me on the old familiar Steinenthal ground; where again everything was conspicuously backward. *Brenthis pales*, usually in swarms, occurred but singly. *Colias phicomone*, afterwards common enough, was also scarce. But I managed to bag a couple of *H. andromedæ*, which I regard as a more or less rare "skipper"; some magnificent forms of *L. arion* var. *obscura*—I have a female in perfect condition, measuring more than two inches in expanse; and, what I think is generally not common in the higher slopes, some good *L. alcon*. The Steinenthal produced a couple of small females, which I daresay should be classed var. *monticola*, Stgr., and almost every day I was out I managed to box a solitary example of the same species, many of the males being quite as large, if not as brilliant, as those which I saw at Biarritz. Such a paucity of *Erebias* I have never found on the Alps. With the single exception of *E. ceto*, including two or three var. *obscura*, Rätzer, and one fine ab. *pallida*, Tutt, no one was really plentiful about Berisal, even *E.* var. *cassiope*, and more notably *E. melampus*, being comparatively few and far between. Higher up, *E. gorge* occurred sparsely on the rocks, and *E. lappona* was fairly common, but almost invariably crippled or crumpled hopelessly; some specimens I took quite fresh having no more than three wings, others showing failure of wing pigment, or imperfectly developed nervures—very shabby fellows all and sombre of hue, not to be compared with the brilliantly banded *lappona* (var. *pollux*) I took in Lapland last year. Under the Wasenhorn I also found a fresh pair of *Pontia callidice*, but at this time the snow was barely melted, the yellow sulphur anemones still in full flower, and all other Alpine plants hardly yet developed. I do not remember to have seen a single *E. stygne* in the week I

was at Berisal, usually one of the commonest of its tribe. *E. tyndarus*, even more so as a rule, had evidently not come on; while the higher stages of the road about the Kulm, usually rich in *E. mnestra* and *E. manto*, only produced a sprinkling of the former species on the two days—July 18th and July 21st—when I was collecting on the slopes which surround the Kulm.

The resting habit of *E. tyndarus* is, I think, worth noting. When the sun is obscured it drops on to the ground, appears to creep some little way quickly, and then squeezing in under the herbage, turns flat on its side, when it becomes practically indistinguishable from its surroundings. *Gorge*, on the other hand, seems to prefer the warm side of a rock, or stone, where it lies motionless with outspread wings; while *glacialis* crawls into the interstices of the moraine, from which nothing but the sun's rays will induce it to "break covert."

It was somewhat of a novel experience again to take all three Parnassiidi in good condition at the same date. *P. mnemosyne* was still haunting the meadows round the delightful Poste Hotel, which has so far escaped the vulgarization and gingerbread magnificence of lower Switzerland, and remains a haven of peace for the naturalist and all who seek quiet and freedom from the herded tourist. *P. apollo*, hardly common this year, was airing its wings by the roadside; and high up, just below the "Fifth Refuge," where a sparkling stream bubbles out from a mass of golden-flowered sedum, were a few *P. delius* of the female ab. *hardwickii*, Kane. On the rhododendrons above *M. parthenie* var. *varia* was flitting quietly about, the bright Simplon form, though I was fortunate enough to secure one beautiful female almost entirely suffused with black, with those characteristic "blues" of the mountains—*P. orbitulus* and *P. optilete*. On the day when I crossed over to the south side of the Pass, July 21st, *Colias paleno* put in a welcome appearance—a large form of great brilliancy, with the white female, and of these I made quite a decent series, having few in my collection, and none of my own taking from localities other than the Brenner. *Paleno* especially affects the alpine-rose, and once missed invites a gallant chase; *phicomone* prefers the lesser hawkweed bloom. I never remember *Canyonympha satyrion* so rare as this year; but *C. arcania* var. *insubrica* was in perfect condition and very fine in the Berisal region. Meanwhile I was keeping a sharp look-out for *Erebia christi*, as single specimens have been taken, I believe, almost at the top of the Pass opposite the Hospice, and I actually netted *P. mnemosyne* at this unusually high altitude, though I was pretty well sure that I had come too late to the Laquinthal when I unfurled my net in that now famous valley on a magnificent but rather windy day. Here, again, I found the known habitat of this difficult little *Erebia* worn and trodden by

innumerable collectors. The whole of the Geneva Entomological Society had pitched their camp within striking distance a week or so before my arrival. Mr. Lowe, Mr. Wheeler, and other British collectors had reported the species scarce beyond precedent. I met M. Morel, the well-known French coleopterist, also in search. But though apparently he bagged a single specimen, I was less fortunate; and for 1907 the *christi* season was at an end.

My stay at the Fletschhorn Hotel was rather marred by cloudy skies; but remembering the Saasthal side of the Rossboden as a former fine locality for *Erebia glacialis*, I thought I would try the moraine, which now reaches down to the river-bed of the Sengbach, and has completely obliterated the old road. I took the pathless side of the valley to keep in the sun. *Chrysophanus* var. *eurybia*, *Rusticus argyrognomon*, a form of *Hesperia alveus*—most perplexing of butterflies—and an occasional fine var. *bryoniæ* of *Pieris napi* kept me interested over a fatiguing trudge. But alas! when I had attained the required altitude, as so often this summer, I was condemned to see the sun with “gold complexion dimmed”; the cloud and mist swept up, and I thought that my two or three hours’ climb would be in vain. Yet there were short, very short, intervals of sunshine, and in these I successfully netted one or two fine specimens of the several *glacialis* borne headlong on the wing over that treacherous sliding detritus, including one “all black” ab. *pluto*. And these, with a single female *mnestra*, always the rarest sex, made up the captures of a long and exceptionally cold day (23rd) for mid-July.

Finding the weather unpropitious, and for other reasons non-entomological, I left Simplon on the 24th, returning to Brigue after an interesting drive to Iselle, through the great tunnel. The morning of the 25th broke doubtfully; low clouds were hanging over Bel Alp, and the atmosphere was of the Turkish bath order. When I arrived at Fiesch in the diligence, however, the sun was out, and the sides of the Furka Road, which from Brigue onwards suggest an excellent ground, were enlivened by a fresh brood of *M. didyma* and some very fine *Satyrus cordula*, all males, a species which occurred right up the Binnenthal, my present objective, and even as high as 4800 ft. at the village of Heiligkreuz. Binn itself retains something of the pleasing and primitive Switzerland with which we were familiar some five-and-twenty years ago. There is no carriage-road through this impressive valley, with its lonely forests and sheer ironstone cliffs; beyond Binn and to the Albrun Pass the path is little more than a mule-track in places, and looked therefore all the more promising. But, whether it was the season or the locality, butterflies were decidedly scarce on all the excursions I made, and I met with few species not already

encountered on the Simplon. *Aporia cratægi*, however, was common enough in the uncut Alpine meadows, and on the Eggerhorn, at about 5000 ft., I was surprised to find *Parnassius mnemosyne* still in very fair trim with *Colias phicomone*, *Argynnis aglaia*, and *A. adippe*. The higher grass-slopes were almost barren. I looked in vain for the usual hordes of *Cænonympha satyrion*, only occasional specimens were flying; but just above the one spring of the whole walk I was fortunate enough to net a worn female *L. alcon*. Liberated from the net she at once settled down to a minute plant of *Gentiana* (? species), and obliged with one or two ova, which I sent home, *in situ*, to Mr. Hugh Main. He handed them to Mr. A. E. Tonge, who has kindly allowed me to reproduce his photograph of these very beautiful eggs, also those of *Z. var. lycidas* discovered by me on the leaves of *Astragalus exocarpus* at the "Second Refuge" (Plate V.). Of the "blues" generally, however, here as elsewhere, there was an unusual dearth; *P. orbitulus* alone appearing in any quantity, with a few *Z. var. ægidion*, *L. arion var. obscura*, and *P. eumedon*.

After a wet day I now set to work to explore the neighbourhood systematically, but the fine days as often as not were marred by a very high wind, while everything was exceptionally backward in the higher regions. The Albrun Pass (7910 ft.), a fine walk ending in a good deal of rocky *débris* with some snow, should have shown sport among *Erebias*. But with the exception of a few worn *E. gorge* of an undistinguished form, and some perfect *Melitea aurinia var. merope* by the wayside, there was again little of note, save that *E. lappona* was here even in more deplorable plight than at Berisal. I did a little better on the several stages that lead up to the Ritter Pass, where the cows, however, had rather spoilt the grassland. On July 27th and again on August 2nd, *Anthrocera minos* was swarming everywhere; a few *P. optilete* and *N. semiargus*, the small mountain form, turned up among the rhododendrons, where again I found a few exceedingly wary *Colias palæno* with one white female snapped off a hawkweed flower. *Vanessa io* was also coming on, and *Brenthis pales*, generally the commonest of insects at this elevation, in some numbers. I also took one very worn *Melitea cynthia*, which puzzled me considerably, inasmuch as on the Collinhorn on August 1st I had taken two very fresh males—the only specimens worth bagging of this pretty fritillary seen at all. There also I met with a single *Erebia pharte*, a couple of *L. alcon*, and some four *L. arion var. obscura*; but even *E. tyndarus* was rarely met with. So that I am inclined to agree with Mr. Fison's conclusions, published elsewhere, that Binn for *Erebias* is not a favoured locality. Ten days' hard work, indeed, added little either to my store-boxes, or to my knowledge of the genus.

Leaving Binn on August 5th, I thought I would try the country round Vallorbes on the frontier from which on so many

early mornings of travel I had gazed from the train window. Ballaigues looked promising in the guide-book. It is about an hour's drive from Vallorbes Station, and situated on the uplands of the Jura, which, well-forested, culminate at this point in Mont Suchet (5236 ft.). But I was not lucky in the two days I could give to collecting, though I fancy at this time of the year the locality is never very productive, again owing to the depredations of the dairy cow. Mont Suchet looms large in the expeditions of the older generation of entomologists. It is but a grass-walk from Ballaigues, and only in the woods under the crest of the hill did I find any butterflies at all. *Cænonympha iphis* (one female) was over, but *Chrysophanus virgaureæ* was freshly emerged, with *Brenthis ino*, *Erebia ligea*, and, higher up, *E. pronoë* var. *pitho*. Lower down, rather worn *Polyommatus damon* still fluttered among the sainfoin in the meadows, and *Pararge egeria* var. *egerides* was not infrequent in the glades near the hotel. On the slopes near the village *Parnassius apollo* was also in first-rate condition, of the conspicuous form which I had met with earlier in the season at Éclépens. I much regretted, however, that I had not crossed to the French frontier, for though Pontarlier itself is not more promising than Vallorbes, I should think the intervening country, and especially in the neighbourhood of Jougne, would be worth investigating. Bruand, who wrote his 'Catalogue of the Doubs' in "the forties," makes a brave show of butterflies for the district; and apparently it has not changed much, except round the little busy frontier town, which is the gate of France. Indeed there, and northward along the Juras, past Belfort and into the French and German Vosges, there is a fine country, apparently unknown to recent entomologists, who content themselves year by year with the familiar treasures of "the playground of Europe."

Harrow Weald: October, 1907.

OBSERVATIONS ON THE SPECIES OF THE GENUS *CALLIMENUS*, FISCHER DE WALDHEIM (ORTHOPTERA, BRADYPORIDÆ).

By A. M. SHUGUROFF (Odessa).*

AMONG the orthopterological material collected by A. A. Brauner in June, 1905, in the valley of Manuich, near the village of Veliko-Kniazheski, in the south-eastern corner of the province of the Don Cossacks, I found a new species of the genus *Callimenus*, Fisch. de W. It is in honour of A. A. Brauner,

* (From the 'Revue Russe d'Entomologie,' 1906, Nos. 3 and 4, pp. 176-183. Translated from the Russian by Malcolm Burr.)

who has done much for the investigation of the fauna of the southern zone of Russia, that I take the pleasure of naming this species.

Callimenus brauneri, Shug., n. sp.*

♀. Tota splendens. Pronotum postice dilatatum, fortius emarginatum, disco postice supra utrinque plicis 4 (1 magna, 1 parva). Lobi mesosternales latitudine vix vel haud longiores, apice magis acuminati; lobi metasternales angusti, latitudine longiores, subparalleli, apice ipso subacuti. Abdomen dorso utrinque plica 1 magna. Cerci ♀ conici, acuminati. Lamina subgenitalis ♀ rotundata, apice excisa. Pronoti lobi deflexi læves.

♂ colore non differt a ♀. Cerci cylindrici, rotundati. Lamina subgenitalis margine subrecto, integro, bicarinata.

	♀	♂
Longitudo corporis :	55 mm.	55 mm.
„ pronoti :	17.5 mm.†	19 mm.
„ femorum posticorum :	18 mm.	18 mm.
„ tibiaram posticarum :	23 mm.	23 mm.
„ ovipositoris :	15 mm	— mm.

Ciscaucasia septentr. districtus Velikoknjazheskensis provinciæ Exercitus Donensis (specimen unicum ♀ mihi ab A. A. Brauner donatum et ei dedicatum); districtus Rostov-Donensis ejusdem provinciæ. Donensis (specimen unicum ♂ mihi a Dom. Sarandinaki donatum). (♂, ♀ in coll. mea.)

Callimenus brauneri, Shug., is generally related to *C. montandoni*, Burr, for which I at first mistook it (the female of that species was at that time unknown to me, *vid. inf.*). But Mr. Malcolm Burr, to whom I submitted my specimen for examination, pointed out to me the characters which distinguished my species from *C. montandoni*.

C. brauneri is distinguished from its congeners by the shining metallic colour of the whole body. The head is black, with a dirty brown shade on the frons, cheeks, and mouth-parts; the pronotum is rugose, with brown markings, and behind with a rather deep (up to 1.5 mm.) triangular incision, and four tubercular folds on the slightly swollen posterior portion, of which the middle pair is large and the outer pair small, and side flaps smooth, slightly compressed anteriorly, coffee-brown, with black-marked impressed spots in the general red-bronze sheen. The lower part of the side flaps is almost straight, rounded posteriorly and slightly reflexed, together with the corners of the pronotum. The lobes of the mesosternum bright yellowish brown, slightly

* In my article, "A Few Notes on Orthoptera" (Rev. Russe d'Ent. vi. p. 22 (1906)), this species is referred to under the name of *Callimenus restrictus*, F. de W. This species was so insufficiently described by Fischer de Waldheim that we may safely regard it as a *nomen nudum*.

† Differentia latitudinis pronoti antice et postice fere 4 mm.

	<i>C. oniscus</i> , Chap.	<i>C. longicollis</i> , Schol.	<i>C. dilatatus</i> , Stal.	<i>C. montandoni</i> , Em.	<i>C. braueri</i> , Shug.
Pronotum, ♂	parallelum	parallelum	postice inflatum	postice dilatatum	postice dilatatum
Pron. margo post.....	vix emarginatus, ♂ ♀	eian minus emarginatus, ♂ ♀	—	postice dilatatum ♂ fort. ♀ min. emarg.	♂ ♀ fortius emarginatus
Pron. margo post-supra utrinque	plicâ 1 magnâ	plicis 2 magnis	plicis binis	plicis 2 magnis	plicâ 1 magnâ, 1 parvâ
Lobi mesosternales ...	triangulares, hand longiores quam basi lati, apice subrotundati	longiores quam lati, apice acuti	breves, horizontaliter producti	hand longiores quam lati, apice obtusi	vix, vel hand longiores quam lati, apice magis acuminati
Lobi metasternales ...	triangulares, obtusi, apice ipso sat acuti, hand longiores quam basi lati	triangulares, hand longiores quam basi lati, obtusi	—	obtusi, apice rotundati, hand vel vix longiores quam basi lati	angusti, longiores quam lati, subparallelâ, apice ipso subacuti
Abdomen, segm. dorsalia utrinque	plicâ 1 magnâ	plicâ 1 magnâ	plicis binis majoribus	plicâ 1 magnâ	plicâ 1 magnâ
Cerci, ♂	cylindrici, rotundati	conici, acuminati	crassi, apice acutodichotomi	cylindrici, rotundati	cylindrici, rotundati
Cerci, ♀	conici, acuminati	"	apice obtusi	conici, acuminati	conici, acuminati
Lamina subgenitalis margin poster., ♂ ...	subrecta, utrinque paulo late marginata bicarinata	subrecta, integra, bicarinata	apice obtusi	subrecta, integra, bicarinata	subrecta, integra, bicarinata
Lamina subgenitalis margine poster., ♀	subrotundata, apice excisa	late sinuata, angulis acutis	amplex, rotundata	rotundata, rotundato-excisa	rotundata, apice excisa
Pronoti lobi deflexi ...	leaves	leaves	leaves	minime rugulosi	leaves
Longitudo pronoti, ♂	17-20	18-22	15	18-5-19	19
" "	15-16	16-17	14	16-5	17-5
Long. femor. post., ♀	20-25	18-5-23	17	19-19-5	18
Long. femor. post., ♀	20-24	20-23	18	20	18
Long. tibiarum post., ♂	30	23	?	26-26-5	23
Long. tibiarum post., ♀	26	26-5	?	26-5	23

longer than broad, pointed at the apex; lobes of the metasternum narrow, elongate, parallel and pointed at the apex itself. Abdomen on the back and sides black, with a light shot-bronze shading; on both sides of the middle line there is a row of large tubercular folds. On the first dorsal segment between the first and the third small black tubercles there is a small yellow spot which surrounds the second tubercle with a radius equal to the distance between the first and second segment. On the second segment the spot occupies a space of the same width, but extending from the anterior to the posterior margin of the segment; beginning with the third segment, and continuing as far as the eighth; between each first and second and second and third small tubercle there is a small yellow spot not fused with the neighbouring spot of the same segment. On the ninth segment the spots coalesce; on the tenth the tubercles disappear, and there remains a scarcely perceptible little yellowish spot. The under side of the belly is bright greyish yellow, the first and second ventral segments with a brown marking.

The subgenital lamina of the female is rounded, with a fairly deep emargination on the apex, without teeth (thus differing from *C. pancici*, Brauner); the cerci (female) are short, conical, and pointed.

The male does not differ from the female in colour, and the cerci are cylindrical, without teeth on the inner side. Subgenital lamina slightly raised, with two keels.

(To be continued.)

NOTES ON BRITISH BRACONIDÆ. V.*

BY CLAUDE MORLEY, F.E.S., &c.

MACROCENTRIDÆ.

THE species of this small family are very familiar insects of fair size and gregarious habits, as many as a hundred occasionally emerging from a single large lepidopterous larva. The pale species of *Zelee* strongly resembles small *Panisci* or large *Meteori*, from both of which the sessile abdomen and neuration will at once distinguish them; while *Macrocentrus marginator* appears superficially allied with the Lissonotid Pimplinæ. The two European genera are known by:—

Occiput not bordered; first segment not longer than second

MACROCENTRUS.

Occiput bordered; first segment much longer than second

ZELEE.

* Cf. Ent. Mo. Mag., 1906, p. 106 (Bracon); Entom., 1906, p. 99 (Microgasteridæ); Entom., 1907, p. 179 (Cryptogastres); and Entom., 1907, p. 217 (Agathididæ).

MACROCENTRUS, Curt.

- (6) 1. Palpi elongate; antennæ at least 45-jointed.
- (3) 2. Labial palpi with third joint not reflexed,
body black 1. *marginator*, Nees.
- (2) 3. Labial palpi with third joint reflexed;
body not entirely black.
- (5) 4. Second discoidal cell nearly one-third
shorter than the first 2. *thoracicus*, Nees.
- (4) 5. Second discoidal cell hardly shorter than
the first 3. *abdominalis*, Fab.
- (1) 6. Palpi short; antennæ at most 37-jointed
- (8) 7. Second abscissa of radial nervure as long
as the first transverse cubital 4. *infirmus*, Nees.
- (7) 8. Second abscissa of radial much shorter
than the first transverse cubital 5. *collaris*, Spin.

M. marginator.—A very abundant species in all marshy spots in May, August, and September, on the flowers of *Angelica sylvestris* and *Lysimachia vulgaris*. I have found it at Herringswell Fen, Barton Mills, Barnby Broad, Claydon, Brandon, Tuddenham Fen, Monks Soham, Ipswich, Finborough Park, Henstead, and Benacre, in Suffolk, often by general sweeping and sometimes after dark; as well as at Metton and Ringstead, in Norfolk; and possess it from Tostock (Tuck); Isle of Arran (Waterston); bred at Lincoln (Musham); Abinger Hammer, Surrey (Butler); Felden, in Herts (Piffard); Whitby (Beaumont); Richmond Park (Bedwell); Guestling, in Sussex, in 1877 and 1888 (Bloomfield); Possil Marsh, Scotland, in 1899 (Dalglish); Point of Aire, in 1904 (Tomlin); Greenings, in Surrey (Wilson Saunders). Mr. Whittle bred it in a breeding-cage containing pupæ of *Sesia cynipiformis*, at Southend, May 21st, 1900; Mr. Thornhill from *Sesiæ* sp. at Boxworth, Cambridgeshire, June 21st, 1902; Col. Partridge from *S. culiciformis*, at Blackheath, May 23rd, 1899; Mr. Mason from *S. asiliformis*, at Caister, Lincolnshire, July 10th, 1905; and Mr. Charbonnier from *S. tipuliformis*, at Bristol, in May. Two males and a female emerged early in the morning of May 13th, 1901, from pupæ of *S. culiciformis*, from near Balmoral, Aberdeenshire; a male and female paired about 7.30 a.m.; when I received them from Mr. James Duncan on the 17th the males were both dead, but the female alive. In 1907 it has been common in August and September, on flowers of *Heracleum* and *Angelica*, at Monks Soham, Depden, and Southwold, in Suffolk.

M. thoracicus.—Not very common; I have only once beaten the male from birch-bushes in Assington Thicks, Suffolk, July 23rd, 1902. Elliott has taken it at Ilkley in Yorkshire; Capron at Shere, in Surrey; Piffard at Felden, in Herts; W. Saunders at Greenings, near East Grinstead; and Platten at light, in Ipswich, September 30th, 1899. Porritt bred a female from an unknown

Noctuid in 1897, and I have found the female flying about a cluster of fungi growing on an old stump, at the end of September.

M. abdominalis.—An abundant species, though more usually bred than taken abroad. I have swept it from reeds at Foxhall, Brandon, and in the Bentley Woods, in Suffolk, in August and July; both sexes occurred in my garden in August, 1907; Mr. Tuck has taken it at Tostock and Benacre Broad, in the same county; Mr. Butler at Abinger Hammer, in August; Mr. Piffard at Felden; Mr. W. Saunders at Reigate; and Beaumont at Plumstead and Blackheath. The sexes are, I believe, invariably bred separately; Mr. Platten bred four males from *Chelonia caja* at Ipswich, July 24th, 1899; Mr. Peachell bred nine females from a larva of the same species at Weymouth, July 27th, 1899; Mr. Musham bred twenty females on August 30th, 1901, at Lincoln, from *Spilosoma* sp.; Mr. Banks bred eight females at the beginning of July, 1905, "from among a mixed lot of microlepidopterous larvæ feeding on oak, collected at Yarmouth, Isle of Wight. Host uncertain (probably *Rhodophaea consociella*, Hb.)"; and I have thirty females which emerged from a dead green Pyralid larva feeding on birch; their larvæ emerged from the host June 23rd, 1905, and became imagines on the 6th of the following June, from Tonge. Donisthorpe found this species in Kerry, in 1902.

M. infirmus.—Rare on the wing; I have only once caught it, by sweeping in an osier carr at Barton Mills, in Suffolk, June 18th, 1901, and Mr. Tuck found it at Aldeburgh, September 16th, 1899; Dr. Capron at Shere, Mr. Piffard at Felden, and Mr. Beaumont at Blackheath and Harting, in Sussex, in August. The sexes are bred separately. Mr. Banks bred fifteen males from their cocoons, which emerged from a larva of *Retinia sylvestrana*, Curt., from the Isle of Purbeck, Dorset, July 18th, 1902; and Mr. S. Kemp has given me a huge bundle of their cocoons, together with the emerged imagines, of which I can count about one hundred and five specimens—all females—upon the surface of the bundle, "bred from a larva found on a sandhill, North Bull, Dublin, June, 1902" (received October 15th, 1902). I took a male on *Plantago major* in my garden, August 27th, 1907.

M. collaris.—Not uncommon, though I have seen no bred specimens. Both sexes at Felden (Piffard); four females at Greenings (W. Saunders). I have only taken the latter sex, of which several occurred on the flowers of *Fœniculum vulgare* in a lane at Alderton, in Suffolk, September 3rd, 1899; several at Gosfield, in Essex, July 24th, 1902; one at the roots of *Erodium cicutarium*, at Brandon, in Suffolk, August 26th, 1906; and one at Shalfleet, in the Isle of Wight, June 26th, 1907.

ZELE, Curt.

- (2) 1. Radial cell of lower wing entire . 1. *testaceator*, Curt.
 (1) 2. Radial cell of lower wing centrally discreted.

- (4) 3. Body testaceous red 2. *chlorophthalmus*, Nees.
 (3) 4. Body nigrescent 3. *discolor*, Wesm.

Z. testaceator.—Not uncommonly captured and bred, though I have only once met with it, about Ipswich, in 1899. Several males at Felden, in Herts (Piffard); South Leverton in Notts, June, 1896 (Thornley); Reigate in August, 1872 (W. Saunders); bred at Caister, in Lincolnshire, by Mr. G. W. Mason, in 1905, from *Cosmia trapezina*; and from an unidentified larva from Hailsham, in Sussex, in July, 1892, by Mr. G. T. Porritt.

Z. chlorophthalmus.—I only possess one male, given me some years ago by Rev. E. N. Bloomfield, who captured it at Guestling, near Hastings, in 1889.

Z. discolor.—Mr. J. E. Campbell-Taylor sent me a single female of this species, which he had captured in the Cardiff district in 1903.

NOTES AND OBSERVATIONS.

ON REARING *P. PODALIRIUS*.—Like Mr. F. T. Gilliat (*antea*, p. 211), I, too, failed with larvæ from ova collected at Hyères this spring. They fed up well on myrobalan plum, but I did not like the look of some of the chrysalids, and in the end all the specimens that emerged were crippled. However, in my case I attributed failure to the fact that I took my pupæ to Switzerland and back, and they underwent many changes of climate and altitude before they emerged after I returned home at the end of July.—W. H. ST. QUINTIN; Scampston Hall, Rillington, York.

OVA OF *ARASCHNIA LEVANA*.—I caged two female *A. levana* captured at the end of June last in Switzerland, and obtained ova from both. As Mr. Sheldon observes in the last number of the 'Entomologist,' the ova are laid in strings, generally, but not always, pendent from the lower surface of the nettle-leaf. My insects laid batches at intervals, from two to five "strings" in each batch. One insect laid two batches, and the other three. The ova are of a pale green when fresh, and simulate wonderfully the spikelets of the flowers and seeds of the food-plant. It was curious to watch the young larvæ hatching. They manage to leave the shell without breaking the connection between the ova. When all the larvæ have left a "string," the transparent egg-shells still remain attached by their tops and bases, and still pendent from the leaf.—W. H. ST. QUINTIN.

ON REARING THE LARVÆ OF *AGROTIS AGATHINA*.—Barrett, in his 'Lepidoptera,' says, in reference to *A. agathina*, that in confinement it seems almost impossible to bring the larva to maturity, and that, so far as he knows, it must be reared on growing heather in the open air. He quotes Mr. Gregson's directions to the same effect, and several contributors to Tutt's 'Hints' seem to agree with him. My experience is that it is quite easy to rear this insect from very young larvæ swept

from *Erica cinerea* in May, feeding them on cut heather in ordinary breeding-cages, kept in a summer house in the garden, sprinkling the food-plant with water every evening.—F. PENNINGTON, JUN.; Reform Club, Pall Mall, S.W., October 1st, 1907.

CHELIDOPTERA (PLATYCLEIS) ROESELII, &C., AT HERNE BAY.—During a visit to Herne Bay last month I noticed a number of grasshoppers on a sunny grassy hillside in the neighbourhood. I caught a few specimens, and found one of them to be a female of *Stenobothrus elegans*. Not being prepared for entomological work, I could do nothing more at that time. Two days later (September 13th), however, I returned to the same district better equipped. I then took *S. elegans* sparingly and *S. parallelus* plentifully, but the event of real interest was the capture of a female of the rare grasshopper, *Chelidoptera* (*Platycleis*) *roeselii*, Hagenb., a species which had been previously recorded from Herne Bay, but seemingly from only one other undoubted British locality. Notwithstanding a prolonged search, no further specimens were met with, and I had no later opportunity of renewing the search.—HERBERT CAMPION; 33, Maude Terrace, Walthamstow, October 14th, 1907.

NOTE ON OPOROBIA (LARENTIA) AUTUMNATA.—It is a long time since I have had the pleasure of taking the above insect. It used to occur freely in birch woods in North Durham. As I knew that it occurred in this (Cleveland) district on alder, I was able to beat some larvæ in June from that tree. I thought I had seen the last of the insect for the season, but I was mistaken. In early July I went as usual to beat for larvæ of *P. piniperda* from *Pinus sylvestris*, and amongst the contents of the tray were some peculiar rusty larvæ. The rust was to a slight extent varied with green. I at once suspected that the larvæ were those of an *Oporobia*, but at the same time they more vividly brought to my mind the larvæ of *E. fasciaria*, so little did they resemble ordinary *Oporobia* larvæ, and so great was the amount of red. The red was not in any manner like the purple which very often appears in the larvæ of both *O. dilutata* and *O. autumnata*. It evidently owed its origin to the same cause as the red of *E. fasciaria* larvæ, *i.e.* an attempt to imitate the red terminal bud of the pine shoots. Passing from pines to larches, I beat similar larvæ from the larch. As at that time I was unwell, I was unable to describe the larva as minutely as I wished. Although, as stated, I suspected at the time that the larvæ were *O. dilutata*, so curious was their coloration I determined, in spite of illness, to rear them. I did so, and was rewarded by breeding in the last week of September some undoubted specimens of *O. autumnata*. When these emerged I went for wild specimens, and was successful. In one case, about 3 p.m., I observed one specimen, with wings unexpanded, crawl out of the *débris* about ten inches from a larch-trunk, climb a grass-stalk, and there rest until its wings were dry. It proved a very dark specimen, but still *O. autumnata*. As all the specimens had the shining appearance supposed to have been acquired in *O. autumnata* from resting on birches, this supposition must be fallacious. The nearest birches are about a mile away, and there, owing to the swampy nature of the ground, no specimens of *Oporobia* occur—at least, I have never beaten

their larvæ nor have I taken the moth, although I have looked at the proper times. I was discussing the subject with Mr. T. A. Lofthouse of this town, and he told me he had long suspected that this insect was a larch and pine feeder. In conclusion, I should like to point out that the elevation of the wood in which the insect occurs is from 600–800 ft. above sea-level. — J. W. H. HARRISON; 181, Abingdon Road, Middlesborough.

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES.—We have just received from the publisher, Mr. Elliot Stock, Paternoster Row, London, E.C., eleven parts of volume ii. of this comprehensive work by Mr. J. W. Tutt. The first part of this volume was issued on February 15th, 1907, and part xi. on July 20th. In the introductory chapters, pp. 1–48, the subjects discussed are *Æstivation* and *Hybernation*, the *Gregarious Habit*, and the *Family Habits of Butterfly Larvæ*. The five species of “hairstreak” butterflies occurring in Britain are next considered, and these the author refers to the three tribes into which he divides the subfamily *Ruralinæ* (*Theclinæ*) of his *Ruralidæ*; the whole being embraced in the superfamily *Ruralides* (*Theclides*). In the first tribe *Callophryidi*, *Callophrys* (*Thecla*) *rubi*, L., is the only species, occurring in the palæarctic region, referable to it, although some North American species probably belong thereto. The tribe *Strymonidi* comprises *Edwardsia* (*Thecla*) *w-aibum*, Knoch, and *Strymon pruni*, L.; whilst *Bithys* (*Zephyrus*) *quercus* and *Ruralis* (*Zephyrus*) *betulæ* are included in the tribe *Ruralidi*. When it is stated that an average of some forty-five pages is occupied in dealing with each species, in its perfect and early stages, it will be understood that the treatment is of the elaborate character the author has accustomed us to in his previous volumes on *Lepidoptera*. Even such details as the time of appearance of the imago, British localities, and distribution abroad are set out at great length. Under *Callophrys rubi*, for example, these matters alone run into about thirteen pages. Altogether there are in the eleven parts 344 pages, and four (? five) plates. The latter are capital reproductions of photographs of eggs of the *Ruralides*, life-history of *Callophrys rubi*, and pupal hairs, &c.

CAPTURES AND FIELD REPORTS.

ENNOMOS AUTUMNARIA AT ASHFORD, KENT.—Early in the morning of October 3rd last I picked up from the pavement in Ashford a male specimen, in very fair condition, of *E. autumnaria*.—D. CHITTENDEN; 14, Limes Grove, Lewisham, S.E.

LEUCANIA VITELLINA IN KENT.—Whilst spending a few days collecting with Mr. E. D. Green, I have had the pleasure of taking a few *L. vitellina* in East Kent.—WALTER DANNATT; Vanbrugh Park, Blackheath.

MOTHS AT LIGHT.—It is true that from one cause and another I have had very little opportunity for collecting *Lepidoptera* during the past season, but so far as I was able to do so, I must say that I never remember a worse one for these insects. A visit to the street-lamps one evening in May (28th) yielded the following:—*Euchelia jacobææ*,

Drymonia (*Notodonta*) *chaonia*, *Spilosoma menthastri*, *S. lubricipeda*, *Pygæra bucephala*, *Dicranura vinula*, and other common species.—JOSEPH ANDERSON; Chichester.

COLIAS EDUSA.—This species having been unusually scarce this season, I was much surprised to find a female at rest on a thistle about 10 p.m. on the 5th inst.—EDWARD GOODWIN; Canon Court, Wateringbury.

DRAGONFLIES NEAR HUNTINGDON.—During recent visits to Hartford, near Huntingdon, I have collected from the River Ouse at that place examples of the following species of *Agrionidæ*:—In 1904 (June 17th), *Calopteryx splendens* (one male); in 1906 (June 18th to 30th), *C. splendens* (one male), *Pyrrhosoma nymphula*, *Ischnura elegans*, and *Agrion puella*; and in 1907 (June 24th to July 6th), *C. splendens* (males and females), *Platynemis pennipes* (one very immature male, with reduced spots), *Erythromma najas* (one very immature male), *I. elegans* (including a female of var. *infuscans*), *A. pulchellum* (one male), and *A. puella* (including a male having the U-shaped spot joined to the circlet behind).—F. W. CAMPION; 33, Maude Terrace, Walthamstow, Essex.

CAPTURES OF LEPIDOPTERA IN CAMBRIDGESHIRE, &c.—I should like to record a few of my recent captures, some of which are as follows:—*Aporophyla nigra*, Hw. Cambridge, at light, September 25th, 1907. I doubt if this has been taken here before.—*Orthosia ocellaris*, Bork. A specimen on a Cambridge lamp, September 16th, 1907.—*O. gilvago*, Esp. Very common here this year. I have seen as many as seventy in one night, and ten on one lamp.—*Heliothis dipsacea*, L. Cambridge, at light, July, 1907; Wicken Fen, at light, August 9th, 1907.—*Hadena ophiogramma*, Esp. One at Shelford, Cambridgeshire, June 20th, 1906.—*Deilephila livornica* (*lineata*), F. One at Shelford, August 3rd, 1905, hovering over lavender.—*Stauropus fagi*, L. An imago, Gog Magog Hills, at rest on palings, July 5th, 1907.—*Homæosoma sinuella*, F. This species seems common in wild places on chalky soil all over the district. Is it still reckoned a coast species?—*Evergestis eatimalis*, Sc. Two at light, Cambridge, July, 1907.—*Pammene ochsenheimeriana*, Z. Devil's Ditch (Newmarket), May, 1905; Cambridge, June, 1906.—*Parasia neuropterella*, Z. Barton Hills (Bedfordshire), August 22nd, 1907.—*Aristotelia lucidella*, Stph. Swarmed in one corner of the lake in Epping Forest, August 2nd, 1907.—*Mompha stephensi*, Stt. Richmond Park, September 5th, 1907.—*Nepticula fulgens*, Stt. Shelford, Cambridgeshire, 1907. (Common, together with *N. tityrella* (?).)—*Ochsenheimeria vaculella*, F. R. Common on oak-trunks (in crevices of the bark), September 5th, 1907. Most of them were in bad condition, many dead and dry.—Mr. A. G. Wilmott, of St. John's College, Cambridge, asks me to mention the following:—*Orthosia xerampelina*, Hb. Ten at light, Cambridge, September, 1907.—*Senta maritima*, Tausch. One at light, Cambridge, August, 1907.—*Loxostege palealis*, Schiff. One at light, Cambridge, August, 1907.—*Chrysoclista linneella*, Cl. Locally common at Cambridge this year.—Not being acquainted with a more up-to-date work, I have used the nomenclature of Meyrick's 'Handbook.'—F. W. EDWARDS; Penwith, Hills Road, Cambridge, October 6th, 1907.

THE LEPIDOPTERA OF GIBRALTAR.—I have read with interest Mr. Sowerby's short list of Lepidoptera collected near Gibraltar in March and April (p. 214), but the dates are so extraordinarily early for some of the species mentioned that I cannot help thinking there must be a mistake of identification in several cases. Commander J. J. Walker, R.N., in his "Notes on Lepidoptera from the Region of the Straits of Gibraltar" (Trans. Ent. Soc. Lond. 1890, pp. 361-391) has thoroughly worked out the butterflies of the Rock and neighbourhood, but I can find no mention of *Erebia tyndarus*—which is a mountain species not found at Albarracin I think, either by Mrs. Nicholl, Miss Fountaine, or Mr. W. G. Sheldon—emerging as a rule not earlier than mid-July; and I can only conclude that Mr. Sowerby has confused it with *Epinephele pasiphaë*, which he does not mention, though it occurs at the end of April at Gibraltar. Again, *Satyrus statilinus* is scarcely to be expected before July, and the same may be said of *S. briseis*, *S. arethusa*, and of *S. circe*, the record of which latter species in March or April at 3000 ft. is wonderful; the more so as apparently the species is reported from Gibraltar for the first time. I suspect, too, that Mr. Sowerby has mistaken *Melanargia ines*, Hfsgg. (= *thetis*, Hübn.), for *M. lachesis* as the date suggests. The type *Chrysophanus virgaurea* has not hitherto been reported from South Spain at all, the var. *miegii*, Vogel, according to Staudinger, not extending beyond the central regions. Perhaps the title of Mr. Sowerby's note requires amendment as to date; no doubt he will explain.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, October 19th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, October 2nd, 1907. Mr. C. O. Waterhouse, President, in the chair.—Mr. J. A. D. Perrins, Junior, of Davenham, Malvern, and Mr. Frank Milburn Howlett, of the Agricultural Department, Pusa, Bengal, India, were elected Fellows of the Society.—The Rev. F. D. Morice gave an account of his reception as the representative of the Society, and of the celebrations at the University of Upsala, and at the Academy of Science of Stockholm, at which he was present.—Commander J. J. Walker showed living specimens of the heteromerous beetle *Sitaris muralis*, first rediscovered at Oxford in 1903 by Mr. A. H. Hamm, of the Oxford University Museum, and found rather freely during September 1906 and 1907, on old stone walls in the vicinity of Oxford inhabited by the Mason Bee, *Podalirius* (*Anthophora*) *pilipes*, on which it is parasitic in its early stages.—Mr. G. T. Porritt exhibited black specimens of both sexes of *Fidonia atomaria* from the Harden Moss Moors, Huddersfield, illustrating the melanic tendency of Lepidoptera in the district.—Mr. H. St. J. Donisthorpe exhibited *Apion semivittatum* taken on *Mercurialis annua* at Deal in August and September 1907; *Magdalis duplicata* from Nethy Bridge in July 1907, the first record of the species for Scotland; *Formica sanguinea* from Aviemore and Nethy Bridge in July 1907, the first record for Scotland; and *Piezostethus formicetorum*, taken with *Formica rufa* at Rannoch, in July, a species which has not been

found in Scotland since Dr. Buchanan White first captured it at Braemar in 1874.—Mr. A. H. Jones brought for exhibition a case of butterflies taken this year from Herculesbad, South Hungary, including specimens of *Erebia melas* from the Domogled, remarkable in their resemblance to *Erebia alecto* var. *nicholli*, Oberth., from Campiglio, and *Erebia lefebvrei*, Oberth., also shown for comparison by Mr. H. Rowland-Brown. Mr. Jones also exhibited examples of *Chrysophanus dispar* var. *rutilus*, and *C. alciphron* from the neighbourhood of Buda-Pesth; both species of great size and brilliant colouring.—Dr. F. A. Dixey exhibited specimens from Uganda of the African Pierine genus *Mylothris*, showing an almost complete gradation between *Mylothris chloris*, Fabr., and *M. agathina*, Cram.—Mr. M. Jacoby showed several fine forms of the *Lycæna bellargus* ab. *ceronus* taken this autumn at Folkestone, including one example of the ab. *cinnides*, Stgr.—Mr. Norman Joy exhibited a specimen of the rare beetle *Cryptophagus subdepressus*, Gyll., taken near Garva, Ross, on August 4th last.—Mr. W. J. Lucas showed on behalf of Mr. Nicholson and Mr. Summers two specimens of *Deilephila euphorbiæ* bred by them from larvæ found in Kew Gardens; also several examples of predaceous insects with their prey.—Mr. H. M. Edelsten exhibited specimens of *Sesia andræniiformis*, bred from pupæ taken in Bedfordshire and Kent, and ova of *Nonagria canna*; describing its remarkable methods of oviposition.—Mr. A. Harrison and Mr. H. Main exhibited four broods from females of *Pieris napi*, var. *bryonia*, captured on the Kleine Scheidegg Pass, Switzerland, in July 1906, showing a wide range of variation.—Prof. T. Hudson Beare exhibited a specimen of the rare bug *Lygæus equestris*, Linn., from St. Margaret's Bay; examples of *Hypera tigrina*, Boh., taken in some numbers on the wild carrot at the same locality—a very local insect, which seems to be confined to the extreme south-east corner of England; and specimens of *Apion semivittatum*, Gyll. off plants of *Mercurialis annua*; all taken during August and September at St. Margaret's Bay.—Col. Charles Swinhoe, M.A., F.L.S., read a paper on "The Species of Hesperiidæ from the Indo-Malayan and African Regions described by Herr Plotz, with some new Species."—Lieut.-Col. Neville Manders, R.A.M.C., read a paper on the "Butterflies of Mauritius and Bourbon."—Dr. T. A. Chapman, M.D., F.Z.S., read a paper on "The Hybernating Habit of the Lepidopterous Genus *Marasmarcha*," and exhibited specimens to illustrate his remarks.

October 16th, 1907.—Mr. C. O. Waterhouse, President, in the chair.—Mr. P. H. Jackson, of 112, Balham Park Road, was elected a Fellow of the Society.—Mr. A. H. Jones exhibited a series of *Pieris napi* var. *bryonia*, from comparatively low altitudes, taken in June last at Peszer, near Buda-Pesth, showing a wide range of variation; and a remarkable aberration of *P. napi* (*napææ*) bearing a strong resemblance on the under side to *P. rapæ*.—Mr. W. J. Lucas showed for Mr. M. Burr an example of *Apterygida albipennis*, discovered by him near Dover this year, and a male specimen of *D. verrucovirus*—an inhabitant of Scandinavia—from the same locality. He also showed, for Mr. H. Champion, *Platycleis roeselii*, Hagenb., female, taken September 13th, 1907, near Herne Bay; and for Mr. E. W. Champion an aberrant form of *S. sanguineum*, male, from Epping Forest; and two

Calopteryx virgo of his own from the New Forest showing failure in pigment. — Mr. W. J. Kaye exhibited specimens of *Callicore aurelia*, Guen., together with a photograph of its larva, showing the remarkable branch-like horns rising out of the head. The whole life cycle is but nineteen days. — The Rev. F. D. Morice exhibited, side by side, a normal male specimen of the bee *Anthidium manicatum*, L., and a monstrosity or malformation of the same insect, which was given him by M. Vachal, of Argentat, Corrèze, France. — Dr. T. A. Chapman said this malformation had clearly no causation in any larval injury, but dated from an early period of embryonic life. — The President exhibited a living ant, a species of *Camponotus*, which had been found by Mr. Watson at Kew, in a pseudobulb of an orchis (probably a *Bulbophyllum*) from the Gold Coast. The bulb was much excavated, but it had no opening by which the ant could have entered. He also showed a large wasp (a *Salix* allied to *dedjax*) with a spider, a *Mygale* rather larger than itself, but which it had captured and was carrying off. These were from German E. Africa. — Lt.-Col. Neville Manders exhibited a melanic variety of *Hestina nama*, captured near Darjeeling; and a monstrosity of *Papilio krishna*, from Sikkim, in which the wings on the right side were much larger than those on the left. — Mr. H. Main exhibited the larva of a hymenopterous parasite of *Pygæa bucephala*, of great size compared with its host. — The President announced that the Council had decided in favour of holding a *Conversazione* at some date next year to be fixed by a Committee of Fellows elected for the purpose of organization, and the Secretary gave some account of what it was hoped the Society would be able to do in the way of exhibits, &c. — H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *September 12th, 1907.* — Mr. Hugh Main, B.Sc., Vice-President, in the chair. — Mr. South exhibited specimens of *Lithosia caniola*, bred from larvæ fed upon lettuce, which they seemed to prefer when in a decaying condition. — Mr. Newman, a few bred specimens of *Eugonia autumnaria*, including two very beautiful dark fuscous forms, the result of a pairing of the unique form bred last year with a typical form. He also showed varieties of *Aglais urtica*, including forms with black hind wings, rayed hind wings, and with discal spots almost obsolete. — Mr. Goulton, living larvæ of *Banksia argentula*, and a series of *Anticlea badiata* showing much variation in the transverse banding and general coloration. — Mr. Harrison, imagines of the same species from Wicken, together with living larvæ. — Mr. Sich, imagines and ova of *Trifurcula immundella* from Surrey, and read notes on the habits of the imagines and larvæ, and giving the characteristics of the ova. — Dr. Chapman, bred specimens of *Arctia fasciata*, from ova obtained by him in Spain. — Mr. Main, a long series of photographs of the life-history of *Charaxes jasius*. — Mr. Tutt read a paper, "Egg-laying of the Brenthids," and a considerable discussion took place.

September 26th. — Mr. Hugh Main, B.Sc., Vice-President, in the chair. — Dr. G. C. Hodgson, of Redhill, was elected a member. — Mr. Tonge exhibited a living larva of *Cucullia asteris* from Sussex, and

showed some stereographic views he had made of insects at rest.—Mr. Ashby, series of *Donacia crassipes* from the New Forest, *D. clavipes* from Wicken, and *Hæmonia curtisi* from Gravesend.—Miss Fountaine, both sexes of the two broods of *Pieris ergane*, the spring specimens from Montenegro, and the autumn from Herzegovina.—Mr. Newman, a very large number of varieties and forms of the various species bred and captured by him during the present season.—Mr. Simmons, a series of *Hemerophila abruptaria* bred by him from a dark wild female crossed with a bred typical male, including a very fine gynandrous example, the left side the ordinary female colour, while the right side had the very dark form of male characters.—Messrs. Harrison and Main, a portion of a brood of *Acidalia aversata*, all of which followed the colour and markings of banded parents.—Mr. Gadge, a fine variety of *Abraxas grossulariata*, with mere remnants of the usual black markings, captured on Denmark Hill.—Mr. Goulton, a bred series of *Euchloë cardamines* of unusual size, particularly the males.—Mr. Main, ova of *Pararge egeria* in situ on grass, and living larvæ of *Phorodesma smaragdaria*.—Mr. Coote, (1) living larvæ of *Celastrina argiolus* on ivy berries, from Eastbourne; (2) a photograph of *Orchis hircina*, from Wiltshire; and a specimen of *Argiades corydon* var. *obsoleta*, from Eastbourne.—Mr. Turner, series of *Parnassius delius* and *Colias palæno* taken in the Engadine in August.—Mr. Sich, (1) *Tineola biselliella*, bred specimens of large size, larvæ fed on red cloth; and (2) *Borkhausenia pseudospretella*, from larvæ found in flax-seed by Mr. W. West.—Dr. Chapman, (1) *Plebius argus* (*ægon*), uniformly dark on the upper side; and (2) larvæ of *Cleogene peletieraria* with imagines from Gavarnie and specimens of *C. niveata* from Corinthia for comparison.—Hx. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 23rd, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. G. H. Kenrick exhibited various Lepidoptera from Wicken Fen, collected by him during a few days' visit. Amongst others were *Erastria argentula*, Hb., which a local man told him was not native to the Fen, but had been introduced there by himself; there were also *Phragmataecia castanea*, Hb., *Meliana flammea*, Curt., *Pyrausta ciliaris*, Hb., &c.—Mr. Hubert Langley showed various Lepidoptera taken by him at Princethorpe Wood, South Warwickshire, during the second week in July; there was a long series of *Boarmia roboraria*, a species hitherto regarded as very rare in the county, but which was very common on this occasion, when many males came to light between 10.45 and 11.30 p.m. at night; there were also *Aplecta prasina*, F., a very dark specimen; *Habrosyne derasa*, L.; *Euchloris pustulata*, Hufn. (*bajularia*, Schiff.); *Cidaria silacea*, Hb., &c.—Mr. L. Doncaster showed a very interesting bred series of *Abraxas grossulariata*, L., bred and arranged in connection with the Mendelian hypothesis. The experiments had been made with var. *flavafasciata* (*lacticolor*, Raynor). He said that in nature the variety occurs only in the female sex. The results of the experiments, whilst according generally with the required Mendelian proportions, were curiously complicated with the sex question; for although in the second generation = cross × cross, the proportions were three to one, yet the males were all the dominant, *i. e.* the type,

and the females half and half; whilst still more curiously, when paired male cross \times pure female var., the results gave half and half each sex, and if reversed and paired male pure var. (obtained during the experiments) \times female cross, the results were all males, type, *i. e.* dominant, and all females, var., *i. e.* recessive. — Mr. G. T. Bethune-Baker showed a series of Turkestan *Arctias*; a large and beautiful series of *Arctia intercalaris*, Er., with light and dark forms; a few *A. erschoffii*, Alph., with var. *issyka*, Std., and a long series of *A. glaphyra*, Er., var. *manni*, Alph.; he pointed out how much some of the *manni* resembled *erschoffii*, and said that he believed they would prove to be forms of one species, and he thought it possible that var. *issyka* would have to be regarded as distinct. — Mr. H. Langley also showed the *Stauropus fagi*, L., from Princethorpe, referred to at the previous meeting.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — *September 17th, 1907.* — Mr. C. W. Simmons, of Tufnell Park, and Mr. E. Turner, of Twickenham, were elected to membership.—Mr. S. J. Bell, *Lycæna arion* from North Cornwall, in excellent condition, although taken between July 25th and 31st, 1907.—Rev. C. R. N. Burrows, two *Agrotis obscura*, females, taken on September 7th and 14th, 1907, and ova laid by same, twelve specimens having been taken at Mucking during late August and early September, 1907.—Mr. J. A. Clark, dark *Boarmia repandata*, similar to London form, from Pitlochrie.—Dr. G. G. C. Hodgson, *Lycæna bellargus*, females, taken in Surrey, Sussex, and Kent between May 26th and July 23rd, 1907; the specimens were unusually blue, which fact Dr. Hodgson suggested had some relation to the inclement season.—Mr. A. W. Mera, *Abraxas ulmata* from Chalfont Road, July 8th, 1907, with black markings almost obsolete.—Mr. C. P. Pickett, *Satyrus tithonus* from Dawlish, August, 1907, including specimens with abnormally large ocelli on forewings and others lacking the usual central white dot in same.—Mr. J. Riches, dark *Cosmotriche potatoria*, from Eastbourne larvæ.—Mr. P. H. Tautz, *Stauropus fagi*, taken at Chorley Wood about July 15th, 1907.—Mr. J. Riches reported having seen a spent *Smerinthus tiliæ* female at Hornsey on September 14th.—S. BELL, *Hon. Sec.*

RECENT LITERATURE.

Australian Insects. By WALTER W. FROGGATT, F.L.S., Government Entomologist, New South Wales. Royal 8vo, pp. 500. Frontispiece in colour, 37 black and white plates containing 270 figures, and 180 figures in the text. Sydney: William Brooks & Company, Ltd. 1907.

In this exceedingly well got up and liberally illustrated volume the author furnishes a text-book on the insects of Australia which appeals not only to the nature lover, but also to the entomological student. To the latter it will be most helpful, whilst the former will find much of interest in its pages, and the illustrations, many reproduced from photographs, will show him a number of the various forms of insect-

life occurring in Australia. The sequence of the orders is as follows:—1. Aptera. 2. Orthoptera (7 plates). 3. Neuroptera (2 plates). 4. Hymenoptera (7 plates). 5. Coleoptera (2 plates). 6. Lepidoptera (Rhopalocera, 3 plates; Heterocera, 5 plates). 7. Diptera (4 plates). 8. Hemiptera (2 plates; Homoptera, 4 plates; Anopleura; and Mallophaga). 9. Thysanoptera (1 plate).

The Termitidæ—here included in Orthoptera, and placed immediately after the Blattidæ, and before the Embiidæ—are well represented; thirty-five species have been detected, and it is thought probable that others may yet be found in Australia. The reproductions of photographs of the mounds built up by “white ants,” on plates iii. and iv., are extremely good; the termitarium of *Eutermes pyriformis* is said to sometimes attain a height of eighteen feet.

Some of the insects belonging to Neuroptera are of curious structure. *Croce attenuata*, for example, has the fore wings like those of a mayfly, but the hind wings are very slender affairs, and greatly exceed the body in length. Among the Odonata, of which family over one hundred species are found in Australia, there is *Petalura gigantea*, measuring from 5 to 6½ in. in expanse. Australia is rich in Hymenoptera, but the Coleoptera are perhaps better known, as our author states that some thousands have been added to Masters' Catalogue, in which 7200 species were enumerated. In Lepidoptera the number of Nymphalidæ has not been indicated, but of Lycenidæ about 114 species appear to be known, although many are local and rare. Just over thirty species of Pieridæ and about twenty species of Papilionidæ occur in Australia; whilst of Hesperiidæ seventy-nine species have been identified. Moths are well represented in all parts of Australia, and among the Noctuidæ are noted *Leucania unipuncta*, *Heliothis armigera*, and *Prodenia littoralis*, all of which have occasionally been observed in England. In 1864 Schiner estimated the number of described Australian species of Diptera at 1056, and since that date a large number have no doubt been added. In this order, and also in Hemiptera, there seems not to be any complete catalogues of Australian species.

Of course, only some of the species in the families of each order are dealt with, but the selection made appears to be a useful one. Discussing the Sphingidæ, our author, on p. 237, states that “they take their scientific name from the fanciful resemblance of their stiff horny pupæ . . . to the Egyptian Sphinx.” We had always supposed that the sphinx-like attitude of the larva when resting suggested the name. Further down on the same page the larva of *Chærocampa celerio* is said to have eye-like spots on the hind segments; in this statement *hind* is probably a misprint for *front*. There are one or two other observations that are new to us, but space does not permit of further reference to them.

Butterflies of Hong Kong and South-east China. By J. C. KERSHAW, F.L.S., &c.

PART VI., completing this work, has recently come to hand. On pp. 121–140 the Hesperiidæ are dealt with. General notes, appendix,

and notes on collecting occupy a further sixteen pages. Various other matters, including a glossary of terms, errata, and index, bring up the number of pages in the volume to 184. There are also eight plates, of which one in colour represents the Hesperid butterflies (plate xiv.). Plates ia-iva give coloured figures of larvæ and pupæ. Life-history and other details are figured on plates via and viia.

The publishers are Kelly and Walsh, Hong Kong, Shanghai, Singapore, and Yokohama; and R. H. Porter, Princes Street, is the London agent.

The following publications have also been received:—

Diptera Danica Genera and Species of Flies hitherto found in Denmark. By WILLIAM LUNDBECK. Part I. Stratiomyidæ, Xylophagidæ, Cœnomyiidæ, Tabanidæ, Leptididæ, Acroceridæ. Pp. 166. With portrait of R. C. Stæger, and forty-seven figures. Copenhagen: G. E. C. Gad. London: William Wesley & Son. 1907.

The majority of the species discussed in this part occur in Britain. The work is to be completed in about ten parts.

Les Premiers Etats des Lépidoptères Français Rhopalocera (Anciens Diurnes). Par M. C. FRIONNET, Professeur de Sciences Naturelles au Collège de Saint-Dizier, &c. Pp. i-xl, 1-320. Three plain plates. Saint-Dizier. 1906. (May be had of A. Hermann, Rue de la Sorbonne, Paris.)

Précis des Caractères Génériques des Insectes, disposés dans un Ordre Naturel. Par le CITOYEN LATREILLE. A Paris, chez Prévôt. Libraire, Quai des Augustins et à Brive, chez F. Bordeaux: Imprimeur Libraire. (1907.) (Sold by A. Hermann as above.)

Pierre-André Latreille à Brive de 1762 à 1798. Par LOUIS DE NUSSAC. Sous-Bibliothécaire au Muséum d'Histoire Naturelle. Pp. 264. Paris: G. Steinheil, Rue Casimir-Delavigne 2. 1907.

Manchester Microscopical Society. Annual Report and Transactions, 1906. Pp. 97. Manchester: The Society. July, 1907. Contains "Notes on Scolytidæ or Bark Beetles," by A. T. Gillanders (pp. 69-75).

Report of the Entomological Department of the New Jersey Agricultural College Experimental Station, New Brunswick, N.J. By JOHN B. SMITH, Sc.D. For the year 1906. Pp. i-iv, 517-670.

The under-mentioned are reprints from the 'Proceedings of the U. S. National Museum':—

The Decticinae (a Group of Orthoptera) of North America. By ANDREW NELSON CAUDELL. (No. 1530, vol. xxxii. pp. 285-410. May 23rd, 1907.)

*Revision of the American Moths of the Genus *Argyresthia*.* By AUGUST BUSCK. (No. 1506, vol. xxxii. pp. 5-24, with plates iv.-v. 1907.)

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[No. 535

NEW AMERICAN BEES.—V.

By T. D. A. COCKERELL.

Nomada lippia sublippia, var. nov.

♂. Clypeus black; no supraclypeal mark; lateral face-marks narrower above.

Hab. Las Cruces, New Mexico, at flowers of *Solidago*, Sept. 15th, 1895 (Cockerell).

Nomada crucis, Ckll.

This was described from males only. At Cloudercroft, New Mexico, Mr. H. L. Vireck took a female (June 16th, 1902), to which I can only refer here. It differs from the male in the larger size, black clypeus, and absence of supraclypeal marks. It is easily known from *N. texana* by the coarse punctures of mesothorax; from *modesta* by the absence of yellow spots on metathorax; from *neomexicana* by the yellow tegulae, and two light yellow bands (the second interrupted) on venter of abdomen; from *modesta rivertonensis* by the flagellum red beneath; from *vegana* by the black clypeus and metathorax.

Nomada (*Micronomada*) *garciana*, sp. nov. (*snowi*, subsp.?).

♂. Length about 7 mm.; black, with the light markings on head and thorax ivory-colour or yellowish-white, the abdominal bands dull yellow; legs clear red, with spots on middle and hind coxae, small spots at apex of anterior and middle tibiae, large spot at apex of hind tibiae, and hind basitarsi, all white. Face pale practically up to level of antennae, the lateral marks extending beyond, and ending at an angle of 45°; antennae red, a little suffused with dusky above, third joint about or almost twice as long as fourth; mesothorax shining, with strong punctures, quite widely separated in the middle; upper border of prothorax, tubercles, a large transverse patch on pleura, scutellum, and post-scutellum, all pale, the scutellums more strongly yellow; metathorax without yellow or white marks, but its lower half

ferruginous; tegulæ yellowish-white; wings long, strongly dusky at tip, b. n. meeting t. m. a little on the outer side, second s. m. nearly as large as third; abdomen strongly punctured, with five entire yellow bands; apical plate very strongly notched; venter with the first two segments largely ferruginous, the third and fourth with broad dull yellow bands. In my table of Rocky Mountain *Nomada* (Bull. 94, Colo. Exp. Sta.) this runs to *N. snowi*, Cresson, to which it appears to be allied. It differs, however, by the ferruginous colour on the metathorax, the absence of black marks on the legs, and the band on first abdominal segment not "deeply indented on each side anteriorly." The scape is obscurely whitish beneath, not with a white spot. It is possible that it represents a southern race or subspecies of *N. snowi*. The spine on anterior coxa is ferruginous, of moderate length.

Hab. Mesilla Park, New Mexico, on the College Farm, May 1st, at flowers of *Melilotus indica*, along with *Halictus bardus*, Cress., *H. mesillensis*, Ckll., *H. pectoraloides*, Ckll. (many), *H. meliloti*, Ckll., *Spinoliella meliloti*, Ckll., *Sphecodes* and *Prosopis*. Named after Professor Fabian Garcia, of the New Mexico Agricultural College.

Epeolus barberiellus, sp. nov.

♀. Length $5\frac{1}{2}$ mm.; black, with the usual pale markings; mandibles and labrum ferruginous; clypeus rugosopunctate; flagellum dull reddish beneath; vertex shining, with strong punctures; mesothorax shining, with strong close punctures; lower part of pleura the same; mesothorax obscurely and suffusedly bilineate, the bands of hair connected with the general hairiness of the anterior lateral margins; scutellum flat, scutellar teeth black and almost obsolete; tegulæ clear apricot colour; wings dusky; legs red, the femora reddish-black except at apex; tibiæ clouded with dusky; spurs red; first abdominal segment covered with hair except a large discal T; segments 2 to 4 with very broad hair-bands, that on 2 narrowly interrupted; fifth and apex reddish, silvery lunule short; venter rufescent. *E. crucis*, Ckll., occurring in the same district, is easily separated by the longer, red, scutellar teeth, the large distinct spot of hair on anterior part of mesothorax, &c.

Hab. Mesilla Park, New Mexico, April 22nd (C. M. Barber).

Perdita lepidii, sp. nov.

♀. Length just over 5 mm.; head blue-green; front and vertex dull, with a granular surface, cheeks shining; face-marks cream colour, consisting of long-pyriform lateral marks, and a light crescent occupying the upper edge of the clypeus, and sending downwards a large lobe-like projection in the median line; labrum black; mandibles with the basal half yellowish-white, the apical ferruginous; antennæ dark, the flagellum dull pale yellow beneath; mesothorax yellow-green, exceedingly shiny, with a strong median groove; scutellum like mesothorax, but post-scutellum and metathorax dull blue-green; pleura blue-green, shining; tubercles cream colour; wings dusky, nervures

and margin of stigma dilute sepia; third discoidal cell very distinct; legs black, with the anterior and middle tibiæ in front, anterior tarsi and the knees, light yellow; middle tarsi pale brownish; abdomen black, with bright yellow markings, consisting of a pair of little spots on first segment, and large oblique marks on sides of second, third, and fourth; venter dark. Labial palpi comparatively short, the first joint about as long as the other three together. Runs in table of *Perdita* (Proc. Phila. Acad. 1896) to *P. obscurata*, from which it differs by the brown nervures and markings of thorax.

Hab. Florissant, Colorado, at flowers of *Lepidium jonesii*, Rydberg, July 28th, 1907; two females (S. A. Rohwer). At the same time, place, and flowers, Mr. Rohwer took *Perdita tortifoliæ*, Ckll., six females, and *P. florissantella*, Ckll., three females, two males. It has occurred to me that possibly *tortifoliæ* may be a mutation of *florissantella*, although the face-marks are radically different, and there is no sign of anything intermediate, unless a single *tortifoliæ* with a little short light stripe on the clypeus can be so regarded. In 1906 the very numerous specimens from *Eriogonum umbellatum* were all *florissantella*; but in 1907 (July 21st-23rd) Mr. Rohwer took from this flower eight *florissantella* and one *tortifoliæ*.

Dioxys aurifusca (Titus).

Chrysopheon aurifuscus, Titus, Canad. Entom. 1901, p. 256 (Colorado).

After studying one of the types of this very distinct species, I am persuaded that *Chrysopheon* is not more than a subgenus of *Dioxys*. The species has some resemblance to the Algerian *D. rufiventris*, Lep.

Dioxys martii, Ckll.

I have before me two examples taken by Professor C. H. T. Townsend at Las Cruces, New Mexico, May 10th and 11th. These show that the venational character cited in the original description (first r. n. joining first s. m.) is not constant; but the species is easily known from *D. producta* by the rounded, not produced, apex of abdomen.

Nomada subaccepta, sp. nov.

♂. Length a little over 8 mm.; head and thorax black, with quite abundant white hair, which is dense and silky on face; clypeus, lateral marks, labrum, basal half of mandibles and scape in front all pale yellow; labrum hairy, and with a small red tubercle; lateral marks very broad below, but rapidly narrowing to a line which ends at level of antennæ; cheeks entirely black; a small red spot above each eye; scape stout, but not swollen; third joint a little over half as long as fourth; flagellum stout but normal (not dentate or conspicuously undulate), red, the basal half black, and the apical more or less dusky, above, though even on the black part there are red sutural

lines; scutellum strongly bilobed, bright red; a little red on post-scutellum; mesothorax black or faintly red; tubercles and a patch on pleura beneath them red more or less stained with yellow; tegulae red; wings dark at apex; b. n. going a short distance basad of t. m.; second s. m. at least as broad above as third; legs red, hind femora black except at apex; middle femora with a variable amount of black; hind basitarsus largely black without; abdomen very minutely punctured, rather light red, first segment with the basal half black, and without any yellow; second to fourth with broadly interrupted pale yellow bands, or large lateral spots, those on second when very large notched anteriorly at the sides; fifth and sixth with narrow bands, not or hardly interrupted, that on fifth when well developed notched posteriorly at the sides; apical plate broad and notched; venter red, the first segment with a large bilobed black patch, the others more or less stained with blackish, the third and fourth with slight yellow markings, the apex with a large yellow patch. In my tables of Rocky Mountain *Nomada* runs to *N. vicinalis*, but differs by its smaller size, base of metathorax with distinct though delicate longitudinal ridges, absence of yellow on first abdominal segment, &c. If the male of *N. accepta* had been unknown, I should have been inclined to refer *subaccepta* to that species; but Cresson describes male *accepta*, and it differs by having only the anterior margin of the clypeus light, &c. In many respects it resembles the Canadian *N. armatella*, Ckll., but the form of the apical plate is different, there is no supraclypeal mark, and the flagellum is not entirely red. In Schmiedeknecht's table of European species it runs to twenty-eight, and runs out because of the red scutellum.

Hab. Florissant, Colorado, two males, June 13th and 15th, 1907 (S. A. Rohwer). One was at flowers of *Antennaria microphylla*.

Another male *Nomada*, taken by Mr. Rohwer at Florissant, on June 15th, also runs to *vicinalis* in the Rocky Mountain table; while in Robertson's table (Canad. Entom. 1903, p. 179) it runs to *N. illinoiensis*. It is really very close to *illinoiensis*, but it has the hair of the vertex and thorax above ferruginous, the scutellum with a pair of large red spots, and the bright lemon yellow on the abdomen very well developed. Its length is 8 mm. I do not describe it as new, because I think it is very likely to prove to be the male of *N. cymbalariae*, Ckll., hitherto known from a single female. The sexes in this group are so different that their correct association is a matter of great difficulty.

Melissodes fremontii, sp. nov.

♂. In nearly all respects, including the structure of the antennae, &c., like *M. confusa*. Cresson, but differing as follows:—Eyes green; face conspicuously broader, eyes more diverging above; antennae black, but in a strong light most of the flagellar joints show a dark red spot beneath; abdomen narrower and more cylindrical; of the four lateral subapical spines which are so prominent in *M. confusa*. the anterior ones are very small and easily overlooked, yet quite well

formed, while the posterior are reduced to mere dentiform rudiments. The apical portion of the marginal cell is shorter than in *confusa*. The *M. confusa* compared is one of Cresson's types.

Hab. Florissant, Colorado, at flowers of *Geranium fremontii*, July 23rd, 1907 (S. A. Rohwer).

Melissodes mysops, Ckll.

Mr. S. A. Rohwer took one female and fourteen males at flowers of *Carduus acaulescens* at Florissant, July 24th–29th, 1907. The males mostly differ from the type in having the yellow of the clypeus strongly trilobed, and the scutellum is often without black hair; but the species remains quite distinct from *M. cnici*.

University of Colorado, Boulder, Colorado :
October 15th, 1907.

NEW MICROJOPPA FROM TRINIDAD.

BY P. CAMERON.

Microjoppa dentipes, sp. nov.

Bright orange yellow, the antennæ, front except laterally, vertex, upper part of occiput narrowly, middle of pronotum, mesonotum, middle of scutellum to the lateral furrows, the third abdominal segment except laterally and the following entirely, black; the black on the apical segments tinged with violaceous. Wings yellowish hyaline to the transverse basal nervure, the following part clear hyaline, the apex from shortly behind the apical abscissa of the radius, the cloud becoming narrowed behind, and a narrower cloud on the apex of the hind wings, fuscous, the stigma and apical nervures black. Legs coloured like the body, the apical half of hind femora, about the basal fourth of hind tibiæ and the four posterior tibiæ, black. Pubescence dense and white. ♂. Length, 14 mm.

Trinidad.

First abdominal segment except narrowly at the base, and the second strongly, acutely longitudinally striated, the basal three-fourths of the third more closely and finely striated. Apex of clypeus with two rows of punctures, the rest of the head smooth. Scutellum sparsely punctured, more closely towards the apex, the sides before the apex irregularly longitudinally striated; the sides stoutly keeled to near the apex, furrowed inside the keel. Basal third of metanotum smooth, the rest closely, distinctly, but not strongly punctured. Areola slightly wider than long, the apex rounded inwardly. Apex of mesopleuræ with a crenulated border. On the inner side of the hind coxæ, near the apex, is a short, stout tooth. Areolet narrowed in front, the nervures almost touching, the recurrent nervure received shortly beyond the middle.

Allied to *M. geniculata*, Cam.

OBSERVATIONS ON THE SPECIES OF THE GENUS
CALLIMENUS, FISCHER DE WALDHEIM (ORTHOPTERA,
BRADYPORIDÆ).

BY A. M. SHUGUROFF (Odessa).

(Concluded from p. 251.)

Returning to a brief revision of the species of the genus *Callimenus*, we are at once struck with the impossibility of determining the greater number of specimens which fall into the hands of entomologists by means of the synoptical tables at present in existence. This is partly explained by the fact that the form of the pronotum varies to a remarkable extent in *Callimenus*, and also the number of keels or ridges on the hinder margin of the abdominal segments. This is most unreliable. It is hard to find two specimens exactly agreeing in colour. The variation, too, in the size of the tubercular ridges on the segments of the abdomen has been sufficiently noticed.

But apart from this individual variability* observed in morphologically equivalent individuals, in *Callimenus*, malformation (*monstrositas*, Missbildung) is, evidently, also observed; at least, it is particularly to this kind of variation that I am inclined to attribute such an incident as, for instance, I have observed in a male in my own collection, when the right mesosternal lobe is bifid at the extremity, although in the diagnosis these lobes should be described as “*magis acuminati*.”

The comparison of the same morphological peculiarities in different species of the genus *Callimenus* enables us to draw up the table given on p. 178,† the material for which was afforded by the descriptions of Brunner, the collection of the Oxford Museum,‡ and the personal observations of the author of this article.

In the genus *Callimenus*, erected by the learned Russian, Fischer de Waldheim, in his letter to Serville in 1833, in the *Ann.*

* In the use of this term I follow the interpretation of Duncker, “*Die Methode der Variations-Statistik*” (‘*Arch. f. Entm.-mech. der Organism.*’ viii. (1899)). Hugo de Fries, for individual variation, employs the term “*fluctuation*,” but Prof. Shimkevich (*Hor. St. Pet. N. H. Soc.* xxxv. 4, pp. 28-29 (1906)) calls it “*flexibility*.”

† [That is, of course, a reference to the pagination of the ‘*Revue*’ in which this article originally appears.—M. B.]

‡ Mr. Burr kindly consented to allow me to publish the synoptical table which was drawn up by him; at the same time he gave me the information about the female of *C. montandoni*, Burr., the description of which had not previously been published. For this friendly assistance I have pleasure in expressing to him my sincere thanks.

[This is a mistake on the part of M. Shuguroff. The material is in my own collection, at present stored in the Hope Museum by the kindness of Professor Poulton. Hence the error.—M. B.]

Soc. Ent. Fr. ii. p. 318, there are included at the present time six species, of which five belong to the European fauna. These five species are the following:—

Callimenus oniscus, Charp. (1839).

C. longicollis, Schulth. (1881) = *pancici*, Brunn.-Watt. (1881).

C. montandoni, Burr. (1898) = *longicollis*, Fieb. non Schulth.

C. dilatatus, Stål (1875) = *inflatus*, Brunn.-Watt. (1882).

C. brauneri, Shug. (1907).

The sixth species, hitherto only known from Persia, is *C. latipes*, Stål.*

The synonymy of the species of *Callimenus* is exceedingly confused.

Thus Lefebvre, in 1831, in Guérin's *Magasin de Zool.* i. No. 5, gave the description of some kind of "Ground Pig"† (*vide* fig. 1 on pl. 5, ♀, *l. c.*) under the name of *Epippiger macrogaster*,‡ in the opinion of Mr. Burr (*in litt.*) entirely distinct from *C. oniscus*, Charp., and approaching the species of the type of *C. montandoni* and *C. brauneri*. In the meantime, every author, from Fischer, of Fribourg,§ to Jacobson,|| regards *C. macrogaster*, Lef., as synonymous with *C. oniscus*, Charp., acknowledging the right of priority to Lefebvre's name.

C. longicollis, Fieb., is queried by Brunner von Wattenwyl¶ as a synonym of *C. pancici*, but, as it seems to me, without sufficient grounds.

Fieber** describes his var. *a* in such a way that his diagnosis may be also referred to *C. pancici*, Br. v. Watt., and especially to *C. montandoni*, Burr, a synonym of which it evidently is.

C. longicollis, Schulthess-Rechberg, was described by that author in 1881 from specimens from Nish, in Servia, in his article, "Eine Excursion nach Serbien."††

Schulthess writes:—"This species is closely allied to *C. oniscus*, Charp., which is common throughout Greece, and is distinguished by the form of the subgenital lamina of the female, the somewhat more obtuse lobes of the metasternum, and through a different arrangement of the folds of the pronotum, which has thus the appearance of a somewhat greater length." In spite of the vagueness of the specific distinctions in the case of Schulthess's species, it is still possible to affirm, with a sufficient

* [A seventh, very distinct, species was brought home by Senor Escalera, also from Persia, and will be described by Bolivar.—M. B.]

† ["*Zemliannaia Svinka*," the popular Russian name for these remarkable insects.—M. B.]

‡ Unfortunately I have had no access to Lefebvre's work.

§ Orth. Eur. 1853, p. 203.

|| Jacobson and Bianki, Priam. i. Lozhn. Ross. Imp. 1905, p. 421.

¶ Prod. Eur. Orth. 1882.

** Syn. Eur. Orth. Lotos. iv. 1853.

†† Mitth. Schweiz. Ent. Ges. vi. 5, 1881, pp. 383-384.

degree of confidence, that he was dealing with that form which was described two years later by Brunner von Wattenwyl under the name of *C. pancici*.

A comparison of the five European species gives us a foundation for the following synoptical table for their determination:—

- | | | |
|---------|--|----------------------------------|
| 1. (2) | Pronotum (male) strongly inflated posteriorly. Subgenital lamina (male) very convex, with a broad emargination | <i>C. dilatatus</i> , Stal. |
| 2. (1) | Pronotum not inflated. | |
| 3. (6) | Meso-sternal lobes cylindrical. | |
| 4. (5) | Length of mesosternal lobes equal to their breadth. Subgenital lamina (male) with slight emargination, but with ridges on the sides; female rounded posteriorly apically, with a sharp tooth in the inner margin; pointed apically in female | <i>C. oniscus</i> , Charp. |
| 5. (4) | Mesosternal lobes longer than broad. Subgenital lamina (male) entire, with lateral ridges; in the female broad, emarginate posteriorly and laterally, with teeth at the posterior angles and at the base; cerci (male) conical and pointed with a strong tooth; same in female | <i>C. longicollis</i> , Schulth. |
| 6. (3) | Mesosternal lobes obtusely triangular; subgenital lamina (male) entire, with lateral ridges, but rounded in the female with an apical emargination, and cerci (male) cylindrical and rounded, but short in female, conical and pointed. | |
| 7. (8) | Mesosternal lobes blunt at the apex. Metasternal lobes blunt, rounded apically, slightly longer than broad | <i>C. montandoni</i> , Burr. |
| 8. (7). | Mesosternal lobes pointed apically; metasternal lobes narrow, longer than broad, parallel, pointed at the apex itself | <i>C. brauneri</i> , Shug. |

From this table it is evident that *C. brauneri*, Shug., stands nearest to *C. montandoni*, Burr, and it is possible that both species may turn out to be local races of one form; for the determination of this question, it is necessary to have material from all localities north, north-west, and north-east of the shores of the Black Sea. At the present time, when in the Zoological Museum of the Imperial Academy of Sciences at St. Petersburg there are only sixteen specimens of *Callimenus* of various species, and in the National History Museum of the Chersonese only two,* and

* See my note about this in the Rev. Russe d'Ent. 1906.

in my collection four, of which two are damaged, it is impossible to solve this question.

The species of *Callimenus* (I do not include *C. latipes*, Stal, in this review) are recorded from the following localities in Europe and Asia Minor:—

Callimenus oniscus, Charp.: Transylvania (Hermannopolis, Prof. Fuss.);* Greece (Thessaly, Epirus, the neighbourhood of Athens); Turkey (Macedonia);† Asia Minor;‡ Roumania (according to Fischer, “Valachia, near mts. Kraiova”);§ Russia (Government of Cherson);|| Province of Kuban (?); ¶ Ekaterinoslav (Veliko-anadol); ** Government of Kharkoff (near the town of Kharkoff;†† and of Voronezh).‡‡

C. longicollis, Schulth. (non Fieb.!) has been found near Nish, in Servia,§§ and in Turkey.|||

C. dilatatus, Stal, has been found at Amasia, and generally in Asia Minor up to Lake Van.

C. montandoni, Burr, was found in Roumania,¶¶ and in Bessarabia.

C. brauneri, Shug., was found in Northern Ciscaucasia, in the valley of the Manuich,*** near Rostov-on-the-Don.

As regards the record by Jacobson of *C. oniscus*, Charp., from the Crimea, it appears that it arose through a slight misunderstanding. The “Station Sennaja,” near which, according to Fischer, Stevens’s *Callimenus* was found, is not in the Crimea, but in the Taman Peninsula, on the south-eastern shore of the Tamansky Gulf; so that all records of Fischer Fr., Jacobson, Brunner von Wattenwyl, and Shuguroff, of *Callimenus* from the Crimea, are based upon a simple mistake in geography.†††

From this review of the geographical distribution of the species of *Callimenus*, the following conclusions are evident: of the five European representatives of *Callimenus*, four have a very restricted geographical distribution, and only one (*C. oniscus*, Charp.) inhabits all the northern, western, and eastern shores of the Black Sea and Greece. With regard to the presence of *C. oniscus* within the boundaries of Southern Russia, the records

* Fisch. Fr. Orth. Eur. 1853, p. 203.

† Brunner von Wattenwyl, Prod. Eur. Orth. 1882, p. 252.

‡ Werner, Sitz. k. Ak. Wien., math-nat. Cl., Bd. cx. Abth. i. pp. 285–286.

§ Fisch. Fr. *op. cit.* p. 203.

|| Shuguroff, Rev. Russe d’Ent. v. 1905, pp. 34–35.

¶ Lindeman, Obsch. Osnov. Entom. p. 206.

** *Ibid.*, p. 206. †† Shuguroff, *l. c.* p. 35. ‡‡ *Ibid.*, p. 35.

§§ Brunner von Wattenwyl, *op. cit.* p. 253.

||| Schulthess, Mitth. Schweiz Ent. Ges. vi. 5, 1881, p. 384.

¶¶ Burr, Trans. Ent. Soc. Lond. 1898.

*** Shuguroff, Rev. Russe d’Ent. vi. 1906, Nos. 1–2.

††† A. A. Brauner told me that a species of *Callimenus* was found by him near Aleshek, but S. A. Mokrzhetzsky informed me of the existence of some species of *Callimenus* near the village of Vodiane in the district of the Dniepr, in the Government of Tabrich.

of many of the older authors are exceedingly doubtful. The discrimination of the species of *Callimenus* by colour and the form of the pronotum is very untrustworthy, and until quite recently it was only to these characters that anyone paid attention when determining specimens of *Callimenus*. These characters have even been admitted for the separation of new species (Fischer de Waldheim).

For this reason a great part of the records of older and even of many modern authors ought to be provisionally referred to other species (*e.g.* the record of Professor Lindeman). Other data may even refer to some new species, but not in every case to *C. oniscus*, Charp.

With regard to the bionomics of *Callimenus*, they are typical natives of the steppe; Girard* writes that the species of *Callimenus* occurs chiefly in dry regions. A. A. Brauner and I. A. Pachosky found their specimens in meadows lying in valleys and streams, and grown over with spear-grass. In Russia, as I have noted in this connection, the genus is adapted to that belt of the arcto-boreal zone which, in the language of S. Korzhinsky, of the Academy, bears the name of "the typical steppe."

Werner, speaking of *C. dilatatus*, Stål, remarks:—"This species appears to be widely distributed in the steppes of Asia Minor. . . . The railway men know them well as the 'railway beetle,' as it often stops on the railway banks, just like *Testudo ibera*."

Finally, Professor Lindeman saw *Callimenus* on the mud volcanoes of Taman.

All these data, it seems to me, support my view which I expressed before, that *Callimenus* is one of the typical inhabitants of the steppe.

THE DRAGONFLIES OF EPPING FOREST IN 1907.

By F. W. & H. CAMPION.

THE prevalence of inclement weather during the summer months occasioned a scarcity of dragonflies in our district, but the warm and sunny days which came towards the end of the season delayed the disappearance of certain species beyond the usual period. No dragonflies were taken after September 22nd.

The thirteen species enumerated below were collected during the year:—

(1) *Pyrrhosoma nymphula* was met with in small numbers

* *Traité Elém. d'Entom.* ii. 1879, p. 166.

from May 11th, when it was in a very immature state, until July 21st.

(2) *Agrion puella* was on the wing longer than in previous years. Specimens began to be taken on June 9th, and an old worn female, with about half of the abdomen thinly coated with dry mud, was obtained as late as August 25th. On July 7th a male was taken while preying upon a small dipteran; a wing recovered from the dragonfly's jaws was examined by Mr. E. E. Austen, who identified it as belonging to one of the Limnobiidæ, *Erioptera flavescens*.

(3) *Ischnura elegans*.—This was probably the commonest Agrionid, and its season was observed to extend from June 9th



SYMPETRUM SANGUINEUM, ab.

to September 17th. Var. *infuscans* was obtained on June 16th and July 14th—three specimens in all.

(4) *Enallagma cyathigerum*.—The distribution of this species was more widely extended than is usually the case. The first capture was made on June 9th, and the last on September 1st. Blue females were taken singly on July 7th and August 24th and 25th.

(5) *Cordulia aenea*.—A few specimens, including a female, were taken on June 9th and 16th. The males were somewhat smaller than those taken in 1906, although they were still of exceptional size. The largest measured 50·5 mm. in length and 70·5 mm. across the hind wings, and the smallest 48·5 mm. by 68 mm. The length of the female was 51 mm., and the expanse 72 mm.

(6) *Brachytron pratense*.—A fine male was secured on June 16th, some miles away from the locality where the female was taken in 1906. No other specimens were seen.

(7) *Libellula depressa* was met with on one date only (June 16th), when a male was taken without a trace of blue powder on the abdomen.

(8) *Æschna grandis*.—If an empty nymph-case referable to this species found on July 14th may be regarded as belonging to the present season, *Æ. grandis* was then on the wing. The first imago was seen on August 4th, and several matured specimens were taken on the 11th, when the females were ovipositing. On August 6th a female nymph was found clinging to the stem of a plant; it was dead but still fresh, having probably left the water during the preceding night or in the early morning, and perished of the cold then prevailing. It had partly disclosed the imago, and the anterior pair of bright yellow thoracic stripes were very conspicuous. The species remained on the wing longer than usual, specimens being taken at as late a date as September 17th.

(9) *Sympetrum striolatum*.—On July 20th we put up a soft-bodied, freshly emerged imago, doubtless of this species, which flew away across a pond. It was immediately seen and eagerly pursued by a sparrow, and a second sparrow quickly joined in the chase. As far as could be seen, the dragonfly fell a victim to the birds, but in any case the pursuit was very keen. Another specimen was taken on the same date, and thereafter immature individuals occurred sparingly until September 17th. On the 8th of that month the earliest matured examples were met with, including some brilliantly coloured males. The latest capture was made on September 22nd.

(10) *Æschna cyanea*.—The first imago taken was a very immature male, which was resting on rushes bordering a pond, and had probably emerged from the water that day (July 21st). Close by was found a nymph-skin which evidently belonged to the imago previously obtained, for both had the extremity of the abdomen twisted to the right. The species never became common, and the last specimen was taken on September 22nd.

(11) *Anax imperator*.—Two rather worn males, the only specimens noticed during the year, were taken on August 11th, the latest date for the species of which any record is before us.

(12) *Lestes sponsa* was found to be very abundant near Epping on August 15th, when a female was taken measuring only 32 mm. in length and 41.5 mm. in expanse. In other parts of the Forest district specimens occurred singly on August 25th and September 17th and 22nd.

(13) *Sympetrum sanguineum*.—Two males were taken on September 15th; in one of them the wings were much frayed, and the other is the subject of the accompanying figure. As will be seen, the margin of the left hind wing comprises two distinct curves of unequal length and convexity, meeting in a strongly marked notch at the end of the median sector. A slight notch is normally present in the wings of large dragonflies and in those of some other Neuroptera, but the example before us recalls in a striking manner the notch, at the corresponding nervure,

in the wings of certain Orthoptera, where the folding under of the wings takes place.

Sympetrum flaveolum was looked for at the proper period at both localities where it occurred in 1906, but nothing of it was seen. A like negative result attended a search for *S. vulgatum*, notwithstanding that a large number of *S. striolatum* were taken and examined for the characters of the rare species.

33, Maude Terrace, Walthamstow :
October 24th, 1907.

DESCRIPTION OF A NEW SPECIES OF *ICHNEUMON* FROM VANCOUVER ISLAND.

By P. CAMERON.

Ichneumon mathewi, sp. nov.

Black; the anterior tibiæ white in front, joints 11–23 of flagellum of antennæ cream-coloured, wings light fuscous-violaceous, the stigma and nervures black, the disco-cubital nervure with a long stump; areolet 5-angled, hardly half the length in front it is behind; the transverse median nervure received shortly beyond the basal. Palpi black. Head and thorax closely punctured; the apical half of clypeus depressed, the sides and apex with scattered punctures. Scutellum roundly convex, the apical slope straight, oblique, less strongly punctured than the rest. Areola large, slightly wider than long, the base not quite transverse, with the sides rounded, the apex transverse; it is stoutly, closely, longitudinally striated throughout; the striæ twisted; the top of the posterior median area is irregularly longitudinally striated, the rest more closely transversely striated; the lateral areæ more stoutly obliquely striated. Post-petiole coarsely aciculated, finely, irregularly, aciculated, striated; the apex in the middle raised, smooth. Gastracæli deep, striated. The ventral fold is distinct on the fourth segment. Antennæ short, stout, tapering and serrate towards the apex. Length, 17 mm. ♂.

Vancouver Island (G. F. Mathew, R.N.).

In the table of the males given by Mr. Cresson (Trans. Am. Ent. Soc. vi. p. 136) this species comes into section i., close to *galenus*. That species (only the male is known) is "long, slender"; its antennæ is also "long, slender," not short and thick, as in the present species, which can hardly be called "slender"; *galenus* has the punctures on mesonotum "indistinct"; in the present species they are clearly defined and distinct. Mr. Cresson's species has the metanotum "densely punctured," while in my species it is stoutly striated. *I. mathewi* is an *Ichneumon* as defined in Dr. Ashmead's table (Bull. U.S. Nat. Mus. xxiii. 17), except that the areola is transverse at the apex. The basal slope of metanotum is deep, steep.

PHALÆNA (BOMBYX) LUBRICIPEDA, LINN.

By T. H. BRIGGS, M.A., F.E.S.

MR. KIRBY, in his 'Catalogue Lep. Het.' i. p. 227, published in 1892, and in his 'Handbook to the Order Lepidoptera,' published in 1897, gives, in my opinion, conclusive proofs that Linnæus, when he described *Phalæna lubricipeda*, meant our white ermine, commonly known as *Spilosoma menthastri*, and not the buff one. Yet all entomological magazines, periodicals, and their contributors from those dates seem entirely to have ignored these publications of Mr. Kirby's.*

I have not seen the first-mentioned book, but in his 'Handbook,' vol. iii p. 130, he refers to—

(i) *Bombyx lubricipeda* (Linn.), Syst. Nat. (ed. x.), i. pp. 505–6, No. 47 (1758).

(ii) Linn., Faun. Suec. ii. p. 303 (1761).

(iii) *Phalæna lubricipeda* (Scopoli), Ent. Carn. p. 208, No. 513 (1763).

(iv) *Bombyx lubricipeda alba* (Hufnagel), Berlin Mag. ii. p. 412, No. 25 (1766).

(v) *Bombyx menthastri*, Esper, Schmett. ii. p. 334, taf. 66, figs. 6–10 (1786); Hüb. Eur. Schmett. iii. figs. 152, 153 (1804?).

(vi) *Phalæna erminea*, Marsham, Trans. Linn. Soc. i. p. 70, pl. 1, fig. 1 (1791).†

(i) Linn. Syst. Nat. (ed. x.), i. pp. 505–6, No. 47 (1758).

lubricipeda. — *P. Bombyx spirilinguis*, alis deflexis *albidis*, punctis nigris, abdomineque quinque fariam nigro punctato.

Larva pilosa, fusca punctis cæruleis, linea dorsali pallida.

Varietatem β non distinctam esse speciem docuit D. De Geer.

Linnæus refers to—

(i) 'Fauna Suecica,' p. 254, No. 823 (1746).

(ii) Goedart, 'Metamorphosis et Historia Naturalis Insectorum,' tt. 23, 38 (1662–1669).

(iii) 'List Goedart,' f. 93 (1682).

(iv) 'Raii Historia Insectorum,' p. 196, No. 155 (1710).

(v) 'Merian Maria Sybilla, De Europische Insecten,' i. t. 46, f. 65 (1730).

* In this paper I have given *verbatim* those of the references to which Mr. Kirby refers, as far as I have been able to have had access to the authors he quotes, and also to other works of Linnæus and other authors on the same subject not mentioned by Mr. Kirby. It must be remembered that our nomenclature dates from the tenth edition of Linnæus's Syst. Nat. (1758), and also that many of the older authors' descriptions are only useful for the purposes of identification, as most of them are descriptions of insects to which no name was applied by them.

† This paper was read at a meeting of the Linnean Society on August 5th, 1788, but, according to Dr. Staudinger, was not published by that Society until 1791, and three other references not material to this paper.

- (vi) Albin, 'Natural History of English Insects,' t. 24, f. 36 (1720).
- (vii) Frisch. Ins. 3, t. 8 (1721).
- (viii) Réaumur, De Ins. 2, t. 1, ff. 7-9 (1736).
- (ix) De Geer, Ins. 1, t. 11, ff. 7-8 (1752).
- (x) Roesel, Ins. 1, Phal. 2, t. 46 (1746-1761).
- (xi) Wilkes, one hundred and twenty copper-plates of 'British Butterflies and Moths,' pl. 20, t. 3, a-5 (1740-1761).

Var. β .

Goedart, Ins. t. 38; Roesel, Ins. 1, Phal. 2, t. 47; Wilkes, pap. 20, t. 3, a-b.

This variety β is the source of all the confusion of names, and was evidently the male of the buff ermine; but Linnæus in all his works only considered it as a sexual difference, and at last treated it only as a variety, and never gave a separate name to it.

- (i) Linn. 'Fauna Suecica,' p. 254, No. 823 (1746).

Phalæna pectinicornis elinguis; alis deflexis albidis; punctis nigris, abdomine ordinibus quinque punctorum. *Mas* flavis ordine transverso punctorum nigrorum obliquorum.

- (ii) Goedart, tt. 23, 38 (1662-1639); t. 23, a male var. β (the buff ermine) and larva; t. 38, a female white ermine and larva.

- (iii) Lister Goedart (1682); f. 93, the var. β , male; f. 96, type, the white ermine female. This author does not name his insects.

- (iv) 'Raii Historia Insectorum' (1710). No. 155, p. 197, *Phalæna media* ex albido sublutea, alis exterioribus punctis paucis nigris; $\sigma\mu\kappa\tau\omicron\iota\varsigma$. This seems to be the var. β ; a male.

No. 40, p. 195, *Phalæna punctata*. This last reference is only named by Linnæus in Syst. Nat. xii., and seems to be a female white ermine. I do not understand the Greek word at the end of each of these diagnoses.

- (v) 'Merian Maria Sybilla, De Europische Insecten,' i. t. 46, fig. 65. "Un Papillon Nocturne, blanc, raïé et tacheté de Noir." (French edition, 1730.) White ermine figured.

- (vi) Albin's 'Natural History of English Insects,' t. 24, f. 36 (1720). A figure of the white ermine and its larva; referred to by Linnæus in his Syst. Nat. x. and xii., and in his 'Fauna Suecica,' ii. (1761). Albin states this is Goedart's No. 96.

- (vii) Frisch. Ins. 3, tab. 8. *Lubricipeda* female figured; no name given.

- (viii) Réaumur, De Ins. 2, p. 61, ff. 7-9 (1736). Mr. Marsham states that he is clearly convinced that it is the *mendica* of Linnæus which is here described, and he states that Réaumur describes the male "as of the colour of a rat," and alludes to the semitransparency of the wings of the female. P. 61, ii.

pl. 1, figs. 4, 7, 9 represent the white ermine, 5 and 6, *mendica*; Réaumur *first* describes the former both sexes, and *then* says he has also obtained from identical larvæ those other forms, figs. 5 and 6.

(ix) De Geer, 1, pp. 183-4, ff. 7, 8 (1752-1778). Knows both species in each sex, but confuses them as one species. He figures (pl. xi. fig. 7) a female *lubricipeda*, and (fig. 8) a male *menthastri*.

(x) Roesel (1746-1761); Theil I. Phal. 2, t. 46 (1753); t. 47 (1753). Two insects are represented on this plate. Tab. 46: The white ermine, larvæ, cocoon, pupa, and imagines; one with wings closed, the other with wings open; both females. Tab. 47: The buff ermine, larvæ, cocoon, pupa, and imagines; one with wings closed, the other with wings open; both males.

(xi) Wilkes, one hundred and twenty copper-plates of 'British Butterflies and Moths'; t. a-6, the white ermine and its larva; t. a-5, the buff ermine and its larva.

Linnæus, Syst. Nat. xii. p. 829, No. 69 (1766).

lubricipeda.—Identical description and references to those of the Syst. Nat. x., except added to the description are the words, "mas alis flavescentibus"; and to the references.

(i) Geoffroy, Paris Hist. Ins. p. 118, No. 21. Describes *menthastri*, but confuses *mendica* with it as a variety, following the lead of Réaumur. This Geoffroy was Etienne Louis, who published 'Histoire Abrégée des Insectes qui se trouvent aux Environs de Paris' (1762).

(ii) Fourcroy, 'Entomologia Parisiensis.' In this work of Geoffroy, edited or published by Fourcroy after his death, ii. p. 263, No. 21 (1785), there is a moth described, *P. lubricipeda*.

P. pectinicornis elinguis, alis deflexis *albidis*, punctis nigris, abdomine ordinibus quinque punctorum.

(ii) Scopoli, 'Entomologia Carniolica' (1763).

(iii) Gron. 'Isöphylacium Gronovianum' (1763). A work I do not know.

Scopoli, 'Entomologia Carniolica,' p. 208, No. 513 (1763).

Phalæna lubricipeda, Linn. Syst. Nat. p. 505-6 (reference to ed. x.); Linn. 'Fauna Suecica,' ii. No. 1138 (1761).

Diagn. *Alba* oculis antennisque nigris; alis deflexis; anticis nigro punctatis; abdomine supra paleaceo; punctorum nigrorum ordinibus quinque; antennæ subtus dentatæ, basi superne albæ, lingua substraminea, alæ anticæ punctis nigris (7, 10) tibiæ nigræ.

Linn. 'Fauna Suecica,' ii. p. 303, No. 1138 (1761).

Phalæna (Bombyx) lubricipeda.

lubricipeda.—Spirilinguis, alis deflexis *albidis* punctis nigris, abdomine quinque faciam nigro-punctato. *Phalæna pectinicornis*

elinguis, alis deflexis *albidis*; punctis nigris, abdomine ordinibus quinque punctorum.

With a reference to Albin's figure, t. 24, f. 36 (the white ermine), and other references not material to this paper, and a further description I have mentioned later when referring to Mr. Marsham's paper.

Fabricius, 'Systema Entomologiæ,' p. 576, No. 68 (1775).

lubricipeda.—B. alis deflexis *albidis*, punctis nigris, abdomine quinque faciam nigro-punctato variat alarum colore et punctorum numero suppa, folliculum cærulescens, stigmatibus rubris. And a description of the larva identical with that of Linnæus in his Syst. Nat., which is not that of the buff ermine, nor is the pupa of that species *cærulescens*, but both are brown.

In both the tenth and twelfth editions of Linnæus's Syst. Nat. he has a var. β , with several references which seem to apply to the male buff ermine, but in both the author states, "Var. β non distinctam esse speciem docuit D. De Geer"; and during the whole of his life Linnæus failed to see that there was any other species included under the name *lubricipeda* than the white-winged one, the only one of which he described the larva; nor did Fabricius separate them. Linnæus seems to have had some doubt about his var. β , as in his twelfth edition he adds the words, "mas alis flavescentibus"; and Fabricius also, when he states "variat alarum colore et punctorum numero," might have had an idea of a second species. Hufnagel, according to Mr. Kirby, described *lubricipeda* and its var. β as *Bombyx lubricipeda alba* and *Bombyx lubricipeda lutea*, but it was, so far as I know, reserved for Esper in 1786 to abandon Linnæus's name of *lubricipeda* for that of *menthastri*, giving the first name to that variety β of Linnæus which he himself in his lifetime had not recognized or described as a species.

Dr. Staudinger, in his Catalogue of 1871, as regards the white ermine, has No. 781, *menthastri* (Esper) = *lubricipeda*, L. S. N. x. 505 exc. var. β , Sc. Ent. Carn. 208 (nom. restituend. ?); and yet, in his Catalogue of 1901, he creates this unnamed variety (which he had expressly separated in his Catalogue of 1871) into *lubricipeda*, Linn., Syst. Nat. x. 505-6, although all the descriptions of *lubricipeda* by Linnæus himself were of a moth with white wings. I do not see how it is possible, by any process of reasoning, to take a name an author has given to a species from it, and give it to an insect that author named only as a variety in all his works.

Other authors have tried for some reason to find a new name for our white ermine instead of the var. β of Linnæus. Mr. Marsham, in a paper read at a meeting of the Linnean Society on August 5th, 1788, which paper, according to Dr. Staudinger, was not published until 1791 (Trans. Linn. Soc. vol. i. p. 70),

gives this insect the name of *erminea*, and states :—" Fig. 1, to which I have given the name of *erminea*, appears to be the moth which Linnæus described, in his Syst. Nat., as *lubricipeda*, and to that moth the name is affixed in his cabinet." And his reason for changing the name seems to be that in the description of *lubricipeda* in the Faun. Suec., second edition, are the words, "mas alis flavescentibus ordine oblique transverso punctorum nigrorum," which is a description of the male of our buff ermine, a moth unnamed by Linnæus.

Mr. Leech, in a paper read before the Entomological Society of London, December, 1898, and published in their volume of 'Transactions' for the year 1899, p. 150, names our white ermine *punctaria*, with references to Mr. Kirby, Cat. Lep. Het. i. p. 227 (1892), and to Cramer, Pap. Exot. iv. p. 233, pl. cccxviii. fig. D (1782), which name (Ray had named it *punctata* in 1710, see *ante*) would have priority over Esper's name of *menthastri* given in 1786.

I think that the whole of these descriptions clearly show that Mr. Kirby was quite correct in stating that the *Phalæna* (*Bombyx*) *lubricipeda* of Linnæus is the white species now generally but erroneously known as *Spilosoma menthastri* (Esper).

For the references to Madame Merian, Fisch, Réaumur, De Geer, and Geoffrey I am indebted to the kindness of Mr. Louis B. Prout, who has consulted these authors, and has given me the results of his investigations.

A BIBLIOGRAPHICAL NOTE ON THE FOOD-PLANTS OF ORIENTAL HEMIPTERA.

BY G. W. KIRKALDY.

IN the Hemiptera of the 'Fauna of British India' (vols. i.-iii.), Mr. Distant has overlooked some records of food-plants made years ago by himself!

(1) Proc. E. S. London, 1879, p. 1 (with Moore) :—

Halyo (!) *dentata*, *Palomena viridissima*, *Piezoderus rubro-fasciatus*, *Agonoscelis nubila*, *Lygæus militaris*,* *Graptostethus servus*.—All on Cucumerinæ.

Coptosoma cribraria on *Lablab vulgaris*.

Bagrada picta, *Pachymerus sordidus*.—Both on *Sinapis dichotoma*.

The names are as given by Distant and Moore.

(2) Proc. E. S. London, 1878, p. lvii :—

Erthesina fullo is eaten by the Nagas.

* Also destructive to *Zea mæis*.—G. W. K.

The following seem also to have been omitted by Mr. Distant, and there are many more records since the publication of his first volume :—

Aspongopus janus on *Cucurbita* and *Cucumeris*.

Canthecona cognata preys on a croton-ravaging caterpillar.

Brachyplatys silphoides is said by Westermann (1821, Mag. Ent. iv. 411–27) to be very injurious to *Oryza sativa* in India, but I have no access to the work. It is translated in Rev. Ent. i. 111–1833.

Myodocha acutus (= *Leptocoris*, Dist.). This is a notorious rice pest; also found on “rubber.” It is preyed on by *Cicindela sexpunctata*.

Leptocoris augur (= *Serinetha*, Dist.). Supposed to be mimicked by the lepidopteron *Phauda flammans* (cf. Rothney, 1894, Proc. E. S. London, p. xv.). It occurs on *Gossypium herbaceum* and *Schleichera trijunga*.

Antilochus coquebertii preys on *Dysdercus cingulatus* (Kirkaldy, 1900, Entom. xxxiii. 295).

Fontejanus wasmanni is termitophilus. (Breddin, 1903, Soc. Ent. xviii. 75.)

Zamila aberrans is destructive to *Saccharum officinarum*. It has been partly confused by Distant with *Dictyophora pallida*.

Peregrinus maidis (= *Pundaluoya simplicia* and *Liburnia psylloides*, Dist.) is destructive to *Zea mais*.

DESCRIPTION OF A NEW SPECIES OF CRABRONIDÆ FROM BORNEO.

BY P. CAMERON.

Dasyproctus spilaspis, sp. nov.

Black; the mandibles, except at the base, brownish red; a conical spot, wider than long, the narrowed end on the inner side, on either side of the pronotum; the scutellar keels, a broad band on the base of the hind tibiæ, the anterior tarsi entirely, the basal two joints and the base of the third of the middle and the basal joint of the hinder, except narrowly at the apex, whitish yellow. The sides of the head, cheeks and face and clypeus densely covered with silvery pubescence. Eyes very large, coarsely faceted, touching the antennæ below, the front with a distinct furrow. Ocelli in a triangle, the hinder separated from each other by a slightly less distance than they are from the eyes. Metanotum with a broad furrow extending from the base to the apex. Abdominal petiole slender, nodose at apex, longer than the thorax and as long as the rest of the abdomen.

The eyes reach to the base of the mandibles. On the outer lower edge of the cheeks is a stout, longer than wide, rounded at the apex, tooth. Apex of tarsi thickened. Appendicular cellule large, clearly

defined; the apical abscissa of the radius has only a slight slope. There is a short broad deep furrow on the base of mesonotum in the centre. ♀. Length 5 mm.

Kuching, September (Mr. John Hewitt).

DESCRIPTION OF A NEW PLUME-MOTH FROM CEYLON.

By T. BAINBRIGGE FLETCHER, R.N., F.E.S.

Alucita melanopoda, sp. nov.

Male, 28 mm. Head, antennæ, palpi, thorax, and abdomen pure glistening white. First and second pairs of legs white above, with a few dark scales below on tibia and first joint of tarsus; posterior legs very long, pure white, tips of spurs black, third and fourth joints of tarsi terminating in a large fan-like tuft of black scales, fifth tarsal joint clothed in black scales. Fore wings cleft from one-quarter; segments linear; pure glistening white, sprinkled with very minute black scales; small clusters of black scales, forming dots, on costa at one-third, one-half, and three-quarters, and on second segment a little beyond middle and at three-quarters. Cilia white, with very pale fuscous patches below first segment before middle, at three-quarters, and irregularly between this latter and apex; also on inner margin at one-third, one-half, and three-quarters. Hind wings cleft firstly from about one-sixth, secondly from near base; segments linear; pure glistening white; a patch of faint fuscous on costa of first segment at three-quarters, and also on inner margin of second segment at three-quarters and at one-half; on second segment a moderate patch of black scales at one-half, and small black dots at three-quarters and at apex.

Hab. Ceylon: Madulsima, November, 1906 (W. Vaughan); Kandy, May, 1907; Haragam, June, 1907 (E. E. Green). Assam: Khasi Hills (coll. Meyrick).

H.M.S. 'Sealark,' Ceylon: October 18th, 1907.

THREE NEW BEES FROM THE ORIENTAL ZOOLOGICAL REGION.

By P. CAMERON.

Nomia nursei, sp. nov.

Black; the scape yellow, the flagellum brownish beneath; the legs bright yellow; the coxæ, trochanters and base of the femora, black; the face and clypeus covered with pale golden pubescence; the apices of the basal five segments of the abdomen banded with depressed

grey pubescence ; the hinder femora broadly rounded above, transverse below and with a sharp oblique tooth near the base of the apical third ; the hinder tibiæ become gradually dilated from the base to the apex. ♂. Length, 8 mm.

Deesa (Col. C. G. Nurse).

Scape bright yellow, marked above with black towards the apex ; the flagellum fulvous, lined with black above. The face, clypeus and lower part of the front densely covered with pale golden pubescence, which hides the sculpture ; the front is closely, almost rugosely, punctured and covered with dark fulvous pubescence above ; the vertex is more strongly, but not so closely or regularly, punctured ; there is a smooth space on the outer side of the hinder ocelli. Mandibles black, shining, more or less piceous-red below and at the apex. The base of the mesonotum, its apex, the post-scutellum, and the pleuræ are densely covered with pale fulvous pubescence. The mesonotum and scutellum are closely, strongly, and uniformly punctured. The area on the median segment is closely obliquely striated on the sides ; the centre is more irregularly and more widely striated ; the middle pair of striæ are widely separated ; the rest of the segment is closely and rather strongly punctured laterally ; the centre is irregularly rugose, and is hollowed in the middle ; it has a vertical slope. The basal four joints of the front tarsi are fringed with long clear white hair, the hair becoming gradually shorter ; the black on the base of the femora is more extended above ; the tooth on the hinder femora is oblique ; the hinder tibiæ are slightly dilated at the base before the middle ; the apical projection is large, and becomes gradually narrowed towards the apex, which is bluntly rounded. Wings hyaline, the apex slightly smoky ; the stigma and costa are dark testaceous ; the nervures paler in tint. Tegulæ dirty yellowish-testaceous, black on the inner side. Abdomen black, with distinct bands of depressed greyish pubescence on the apices of the basal five segments ; the basal three segments are strongly and closely punctured ; the apical are closely and rather finely rugosely punctured ; the sixth segment has the apical half covered with longish pale fulvous pubescence ; the last is thickly covered with long pale golden hair. The basal segment is roundly incised in the middle ; the last is densely covered with longish pale fulvous hair.

Comes near to *N. fervida*, Sm., but may be known from it by the different shape of the hinder legs. In *fervida*, for instance, the hinder tibiæ are broadly dilated in the middle behind, and end in a long sharp point ; the base of the femora below is turned upwards, in the present species downwards, there being a gradually rounded curve from the base to the tooth.

Colletes nursei, sp. nov.

Black ; the head and thorax thickly covered with white hair ; the abdominal segments broadly banded with white pubescence on their apices ; the apices of the femora, the tibiæ, and the tarsi dark ferruginous, and covered with pale fulvous hair ; the wings hyaline, with

a faint fulvous tinge; the stigma and nervures dark rufous. ♀. Length, 14-15 mm.

Ferozepore (Col. C. G. Nurse).

Clypeus shining, almost bare, distinctly irregularly punctured; the punctures on the lower side more elongate and larger than on the upper; in the middle, commencing near the top, is a wide, shallow, irregular, longitudinal furrow; the apex projects, and is depressed above the projecting part. The labrum is large and projecting; there is a wide and deep furrow on either side; and in the centre, on the apical two-thirds, is a deep furrow with oblique sides, which make the furrow much wider on the top. Apex of mandibles piceous. The vertex is closely, uniformly punctured; the front is much more strongly punctured, but not quite so closely; its upper half is deeply furrowed. Thorax entirely and thickly covered with white hair; the mesonotum is shining and is rather strongly, but not very closely, punctured. The basal areae of the median segment bear stout longitudinal keels; its apex is bounded by a stout keel, so that there is formed a row of squarish areae; the apex of the segment has a vertical slope. The hair on the legs is long and glistening; that on the outer side is brighter and more silvery in tint than on the inner side. The amount of red on the legs probably varies, and is almost hid by the black hair. Abdomen black; the apices of the segments obscure piceous, and thickly covered with a broad band of white pubescence; the base of the basal segment is broadly covered with white pubescence; the last segment is thickly covered above with long black, stiff pubescence; the basal segments are narrowly banded with white pubescence.

Megachile confluenta, sp. nov.

Black; the hair on the head, thorax, and legs white, tinged with grey; the ventral scape bright red; that on the under side of the tarsi of a paler red; wings hyaline, tinged with violaceous, especially towards the apex; the nervures black. Mandibles with a broad, shallow, rounded, curved incision beyond the middle, without distinct teeth; the apex bluntly rounded. ♀. Length, 8-9 mm.

Luirdu, Sarawak, Borneo; June.

Clypeus closely, somewhat strongly punctured throughout; the apex transverse, except at the outer edges, which are roundly curved. Face more closely and much less strongly punctured, except on a small semicircular space on the centre of the apex; the sides of the clypeus with dense long white pubescence, the centre much less thickly haired. The puncturation is close, distinct, less strong on the metanotum than elsewhere. Back of abdomen finely, closely, less strongly punctured than the thorax. The hinder ocelli are separated from each other by about the same distance as they are from the eyes.

Characteristic of this species are the mandibles, which become gradually narrowed to a bluntly rounded point without teeth, not broad and oblique there as in, e. g. *M. alticola* and *M. mœra*.

A BIBLIOGRAPHICAL NOTE ON THE FOOD OF MIRIDÆ (HEMIPTERA).

BY G. W. KIRKALDY.

IN the 'Entomologists' Monthly Magazine' for May, 1903,* Dr. Reuter summarizes the literature on predaceous Miridæ, showing clearly, what was indeed well known to hemipterists previously, that the Miridæ are by no means exclusively phytophagous.

The following references, some overlooked by Dr. Reuter, others of later date than his communication, may be useful:—

1. CAUDELL, 1901, Proc. E. S. Washington, iv. 485. *Plagiognathus obscurus* biting human being.

2. KERSHAW, 1905, Trans. E. S. London, 7. Capsid (?) sucking lepidopterous pupa.

3. MERRIFIELD, 1907, Proc. E. S. London (for 1906), p. xc. *Heterotoma merioptera* destroying eggs of *Papilio*.

4. NOWICKI, 1871, Verh. zool. bot. Ges. Wien, xxi. Beih. 52. *Miris dolabratus* said to attack the dipteran *Chlorops tæniopa*.

5. VERHOEFF, 1891, Ent. Nachr. xvii. 26. *Deræocoris ruber* (*Capsus capillaris*) preying on Aphidæ.

ON THE BORNEAN TIPHIIDÆ, INCLUDING A NEW GENUS.

BY P. CAMERON.

CYANOTIPHIA, gen. nov.

♀. Middle tibiæ with two spurs. Marginal cell half closed at apex. First transverse cubitus entirely absent; transverse median nervure interstitial; transverse median in hind wings angled and broken in the middle. Tegulæ large, about half the length of the pro- and mesonotum. Base and apex of thorax transverse; the top of metanotum keeled at apex, and bearing longitudinal keels. Base of first abdominal segment transverse, strongly keeled above; the second segment with a crenulated furrow at the base. Hind tibiæ stoutly serrate; claws bifid unequally; hind femora dilated roundly below at the apex. Base of second abdominal segment largely produced below the apex of first. Mandibles edentate, large, furrowed in the middle. Body for the greater part blue.

May be known from the described Old World genera, *e.g.* *Tiphia*, by the middle tibiæ having two spurs, by the abnormally large tegulæ, by the almost closed radial cellule in female, and

* 'The Food of Capsids,' pp. 121-3.

by the broad keeled base of abdomen. Its nearest ally appears to be the American *Paratiphia*, which may be known from it by the radial cellule in the female being entirely open at apex, by the first transverse cubital nervure being only obliterated below, by the broad temples, and by the bidentate mandibles. The blue coloration of *Cyanotiphia* is peculiar, and has not been recorded before with the Tiphids.

Cyanotiphia ruficauda, sp. nov.

Black, tinged with blue; the basal five abdominal segments blue, the apical red; legs black, densely covered with long white hair, the four anterior calcaria white, the posterior fulvous, the hind tibiæ with six stout spines, which become gradually longer and thinner, the apical being considerably longer and thinner than the others. In the centre of metanotum are two straight keels, which converge slightly towards the apex, between them is a more irregular one which does not reach to the apex; on either side are two slightly curved keels, united at the base, the inner of which does not quite reach to the apex; the space between these keels is irregularly transversely striated. Metapleuræ smooth at the base, the rest somewhat strongly, closely, obliquely striated, the two parts being separated by a furrow. Head, pro- and mesonotum strongly punctured, the punctures clearly separated, the propleuræ strongly, closely, irregularly striated, the mesopleuræ closely rugosely reticulated. Basal slope and a narrow band on the apex of first abdominal segment smooth, the rest closely distinctly punctured. ♀.

The body is much less densely pilose than in *Paratiphia*; the abdominal segments, too, not being fringed with hair. Length, 8 mm.

Quop, Sarawak; October (John Hewitt, of the Sarawak Museum).

Tiphia borneana, sp. nov.

Black, shining, sparsely covered with whitish pubescence; the four anterior tibiæ and tarsi testaceous, the anterior paler than the middle; palpi pale testaceous, tegulæ testaceous, wings hyaline, the nervures and stigma black. Flagellum of antennæ fuscous. ♂. Length, 5 mm.

Quop, Sarawak; October (John Hewitt).

Front strongly punctured, the vertex punctured on the sides and centre. Face aciculated, the clypeus punctured, its centre with an incision, which becomes gradually widened. Mandibles ferruginous at the apex. Basal half of pronotum sparsely weakly punctured, the meso- and scutellum sparsely but distinctly punctured; the post-scutellum smooth. Metanotum with a strong lateral and a weak central keel, the space between strongly aciculated. Upper half of metapleuræ widely, not very strongly striated, the basal lower half aciculated, the apical weakly striated. Basal two abdominal segments glabrous, the others covered with pale pubescence; pygidium closely punctured, reddish at the apex. First abscissa of radius roundly

curved, nearly as long as the others, which are of equal length, oblique, the apical slightly curved at the apex; the second cubital cellule more than twice the width of the base at the apex, the recurrent nervure received near its apex. Temples short, obliquely roundly narrowed.

The known Bornean species of *Tiphia* should be known thus:—

- 1 (2) Wings fuscous violaceous; length, 15 mm. *fumipennis*, Sm.
- 2 (3) Wings yellowish; the nervures and stigma
testaceous; length, 10 mm. *flavipennis*, Sm.
- 3 (2) Wings for the greater part hyaline.
- 4 (5) Length, 5–6 mm.; the nervures and stigma
black; the four anterior tibiæ and tarsi tes-
taceous; the abdominal pile pale *borneana*.
- 5 (4) Length, 10 mm.; the nervures pale testaceous;
the legs black; the abdominal pile blackish. *stigma*, Sm.

NOTES AND OBSERVATIONS.

DENTON'S PATENT BUTTERFLY TABLETS.—We have received a sample of these tablets. The butterfly in it is a specimen of *Cethosia cyane*, from Assam. It is mounted in its air-tight case, to show the under side. Whilst speculating as to the practical use specimens treated in this way could be to the entomologist, the thought occurred that it might be a good plan to have a few of such tablets by one. Non-entomological friends often wish to make closer examination of specimens than it would be prudently admissible for them to do in the ordinary way, but enclosed in these cases the most fragile insect might be safely handled by the uninitiated.

SOME MEASUREMENTS OF *SYMPETRUM SCOTICUM*.—A series of the small black dragonfly, *S. scoticum*, obtained by us at the Black Pond, Surrey, on 20th September last, include two or three particularly small males. The smallest of them measures only 27·5 mm. in length and 42 mm. across the hind wings. This specimen affords an interesting contrast with a large male taken at the same place on 3rd September, 1906, the length of which is 33·5 mm. and the expanse 52 mm. F. W. & H. CAMPION; 33, Maude Terrace, Walthamstow, November 6th, 1907.

FOOD-PLANTS OF *OPORABIA AUTUMNATA*.—With reference to Mr. Harrison's interesting note (*antea*, p. 255), I may add that in my paper on "The Life History of *Oporabia autumnata*" (Trans. City Lond. Ent. Soc. ix. 42–52), I recorded as food-plants, fir (Doubleday, *teste* Guenée), and larch (Püngeler, *in litt.*), besides birch, alder, oak, willow, aspen. Evidently, although having certain definite preferences, it can accommodate itself to almost anything, for in the same place I quote a record from Sparre Schneider to that effect; and in Part x. of the same Society's Transactions (p. 18), I record breeding a series from

larvæ found at Pontresina, by Dr. Chapman, on honeysuckle, alder, &c. Both Mr. Allen and myself have successfully reared it on hawthorn. Surely there is one slip in Mr. Harrison's note which needs correcting. He speaks of purple as "very often" appearing "in the larvæ of both *O. dilutata* and *O. autumnata*." According to Guenée, and to Mr. Allen's very wide experience (Ent. Rec. xvii. 339) and my own not inconsiderable, the larva of *O. autumnata* is never so adorned. The interesting new phase of coloration observed by Mr. Harrison is, as I understand him, something quite different.—LOUIS B. PROUT; 246, Richmond Road, N.E., November 1st, 1907.

THECLA PRUNI AB.—It may be of interest to record a curious aberration of *T. pruni* bred from a larva which I obtained in Huntingdonshire this year. The under side has, in place of the usual broken bluish white line, a complete series of pale blue bands joining the black spots on the inside of the orange band on the hind wings, and merging into the brown colour on the fore wings. These bands fill the space between the nervures with blue for about one-eighth of an inch on all the wings. The upper side is normal, except that the general colour is rather dingy for a bred specimen.—C. N. HUGHES; Knightstone, Cobham, Surrey.

MACROGLOSSA STELLATARUM FLYING ON SHIPBOARD FROM GIBRALTAR TO SUEZ.—I noticed a specimen of *M. stellatarum* flying around the ship just before getting to Gibraltar on October 1st. In the evening it settled in the dining saloon. I was going to secure it, when I noticed it had a snapped wing and so left it alone. The next day I saw the same specimen again, but what was my surprise after leaving Marseilles, where we had stayed a day and a-half, still to see the same insect, after which, with the assistance of Miss Fountaine, we kept a good look-out for it. Next we called at Naples and Port Said, but it was still with us. However, on the night of October 12th, after passing through the Suez Canal, Miss Fountaine informed me that it had met with an untimely death at the hands, or rather feet, of one of the stewards, after which we saw no more *M. stellatarum* up to the time of my leaving the boat at Aden.—W. FEATHER; care of British Somaliland Fibre and Development Company, Berbera, Somaliland, Africa.

TO PREVENT MOULD IN RELAXING-BOXES.—One day this summer, a bottle in which I kept oxalic acid having got shaken in travelling, I stood it in the somewhat mouldy lid of a relaxing-box while I killed some insects. I noticed next day that the mould had been removed by the oxalic incrustation on the bottle. Since then I have put a little oxalic into the silver sand into which I dump my killed insects till I have leisure to set them, so far as I know, with none but good results. I do not see that the oxalic, thus used, can damage the pins, since pricking the insect with it apparently has no such effect. Perhaps some entomologist with a knowledge of chemistry will tell us; the matter would seem to be of some interest, for a good method of preventing mould does not appear to be generally known.—H. V. PLUM; Lower School, The College, Epsom, November 14th, 1907.

PYRALIS LIENIGIALIS, Z., NEAR OXFORD.—When writing my note headed “Re-occurrence in Britain of *Pyralis lienigialis*, Z.” (*antea*, p. 235), I had completely forgotten that an individual of this rare species had been recorded, in Ent. Mo. Mag., ser. 2, xiii., 273 (1902), as captured near Oxford on August 22nd, 1902, and exhibited by Mr. South at a meeting of the South London Entomological Society held on October 9th of that year. I have just come across my manuscript note, made in 1902, giving the reference to this record which shows that the insect has occurred in one English county besides Bucks. It is regrettable that the name of the captor is omitted, and especially so that the precise county in which the moth was taken is not specified, for “near Oxford” might refer equally well to part either of Berkshire or of Oxfordshire.—EUSTACE R. BANKES; Norden, Corfe Castle, November 17th, 1907.

NOTE ON THE NAME OF A CICADA.—The Central American species which Distant (Cat. Cicadidæ, p. 121) calls *Herrera marginella* is based on *Cicada marginella*, Walker, 1858; but it is not the *Cicada marginella*, Fab., Syst. Rhyn., p. 96. The synonym *Carineta ancilla*, Stål, 1864, is available, the species becoming *Herrera ancilla*.—T. D. A. COCKERELL.

OPIHUSA LIANARDI AND ITS VARIETIES.—I think that a few remarks upon this extraordinary moth will be of some interest, especially, perhaps, to those who are acquainted with the species, and I shall be very glad to receive further notes from collectors or rearers of the moth. In Natal *O. lianardi* occurs usually about once in every three years, and then it simply swarms. What becomes of it in the interval has so far not been satisfactorily ascertained. It has been suggested that the larvæ feed upon the flowers of a very common plant here called the buckweed, which only flowers every third year; but although I have very carefully looked for the larvæ upon the flowers of this plant, I have never found it thereon. I feel certain that the buckweed is not the food-plant. The few larvæ I have found were feeding upon the suckers growing on a tree that the hawk-moth, *Baniana postica*, feeds upon. I am unable to give the scientific name of this tree, as I believe that it has not yet been named. I am of opinion that *O. lianardi* is migratory, visiting us either from Portuguese Africa or Rhodesia, as in both places the moth occurs. It is chiefly remarkable from the fact that it flies commonly by day, and for the number of forms that it assumes. In a collection that I have before me there are fifty-seven specimens, all of which are different, and in at least twenty instances the difference is so great that almost anyone would think they belonged to some other species of *Ophiusa*. As a rule, however, the markings on the hind wings are constant, but in some instances the white markings are absent from them. In 1905 this moth was so common here as to be a nuisance, and from any grass at the sides of the roads in the town they flew up in numbers when disturbed. There must have been hundreds of thousands of them in Durban and its suburbs alone. I hear that the moth was just as common at Pietermaritzburg and all along the south coast as far as Park Rynnie, a distance of forty miles; a few, I am told, turned up in 1906, but the moth has not been seen since up to the end of August,

1907, and as the buckweed has been in flower this winter, it cannot be the food-plant, or *lianardi* would have turned up by now, as all the other *Opiniusa* species have been about for the last six weeks. It was common in 1902 and 1905, as previously mentioned, and I feel certain it will turn up again in 1908. I have had as many as thirty pupæ of the moth at one time, and all not ichneumonised have emerged within a month, so the moth, I think, cannot go over in the pupal state. There are several species that do go over from one year to the other in the pupal state, but they are chiefly Saturnids and Lasiocampidæ. Two Sphingidæ remain under the ground in the larval state for about eight months, whilst other larvæ of the same moths change at once into pupæ; these are *Andriasa mutata* and *Nephele argentifera*. I have also had *Daphnis nerii* remain for over six months in the pupal state, but this is very unusual, as the larvæ pupate upon the surface of the ground or in the dead leaves.—F. T. LEIGH; Durban, Natal, August 31st, 1907.

COLIAS EDUSA IN 1907.—Has *Colias edusa* really been so “unusually scarce this season” as Mr. Edward Goodwin’s note (*antea*, p. 257) appears to suggest? The only likely opportunity that I had of making its acquaintance was while spending a portion of the month of September on the South Coast, and what I learned regarding the species during the earlier part of that time led me to think that, although it could hardly be regarded as common, it was far from being rare. The first I heard of it was a report by a friend, who had preceded me by a few days, that he had seen one flying over the downs below Beachy Head, on the 3rd of the month, and that two others had been noted at the mouth of the Cuckmere river at about the same date. On the 8th I captured one, and my brother another, in the same place as the first-mentioned specimen; on the 9th one was seen about a mile inland; on the 11th another, on the downs below Beachy Head; and, finally, I captured another, on the lower part of Seaford Head, on the 14th, thus accounting for eight specimens in all during possibly two or three hours’ ramble on each of some twelve days. From what I was able to see of the individuals noted, I am inclined to regard them as probably being immigrants; this is, however, merely a matter of opinion, and it would be of interest to know whether other parts of the South Coast were similarly affected, or, indeed, whether the species has been noted in other places.—ROBERT ADKIN; Lewisham, November, 1907.

THE FOOD-PLANTS OF PYRAMEIS CARDUI.—Of the adaptive habit of the larvæ of *Pyrameis cardui*, an interesting example was presented this year in the village of Binn, Valais. The ova of a brood evidently had been laid upon some nettles growing sparsely by the side of a chalet. These had all been consumed to the ground, or otherwise destroyed, before the larvæ were half-fed, and they had betaken themselves *en masse* to the only other weed in the immediate neighbourhood, which happened to be a *Chenopodium*—a plant that I have not seen recorded as food for the species, though Mr. Buckler reared it successfully on *Malva sylvestris*, and Mr. W. H. S. Fletcher found it on *Echium vulgare* (Buckler’s ‘Larvæ of the British Butterflies, &c.’

vol. i. pp. 174-175); while Rühl gives, in addition to thistle, nettle, and milfoil, *Lappa officinalis* (burdock), *Gnaphalium* and *Parietaria*, *Filago arvensis*, *Nonnea pulla*, and, in the Lybian Desert, a kind of *Silybum*. M. André, in his recently published 'Catalogue of Butterflies of the Department of Saône-et-Loire,' mentions *Helichrysum arenarium*; M. Guenée cites *Eryngium* ('Lepid. of Eure-et-Loir'); M. Frionnet (Haute-Marne), artichoke. For Scandinavia, Professor C. Aurivillius gives mallow, and "several other plants" (names not given), besides nettles and thistles of various species.—H. ROWLAND-BROWN; Harrow Weald, October 19th, 1907.

ON THE DISCOVERY OF THE LARVA OF *TRICHOPTILUS PALUDUM*, Zell.—Reading the Rev. Pickard-Cambridge's note on the discovery of the food-plant of *T. paludum* in the August number of the 'Entomologist,' I see he states that larvæ were found in the Esher district by Dr. Chapman through a clue given by Mr. Eustace Banks, that *Drossera* was the food-plant of this insect. I should like, however, to state that I captured a specimen of *T. paludum* in the Esher district on August 27th, 1904, which I believe is the first record for Surrey, as stated in the November number of the 'Entomologist' for that year. I may suggest that it was by reason of this capture that Dr. Chapman and Mr. South visited the spot on the 31st May, 1905, and obtained larvæ there.—ARTHUR J. SCOLLIICK; 8, Mayfield Road, Wimbledon, S.W., November, 1907.

THE LEPIDOPTERA OF GIBRALTAR.—Re Mr. Rowland-Brown's note on my list of the Lepidoptera of the Straits, I find that I have made no mistake about the months. I cannot account for the difference between my dates and those of other observers unless atmospheric conditions which, according to the Spaniards, had greatly affected the vegetation, had also affected the insects. But as this, to me, seems hardly probable, I think that on a fuller examination the insects I mention will be found there, on or about the dates on which I found them. As to the names, all my specimens were identified by comparison with others, and I think are all correct, but I should be very pleased to send Mr. Rowland-Brown any which he would care to verify. I might here state that a great many of my observations were made, I believe, much further afield than those of Commander Walker and most other English entomologists, notably at Gaucin and Benaocaz.—F. W. SOWERBY, R.N.; Navigation School, Portsmouth.

"HOMING" INSTINCTS (?) OF HYBERNATING INSECTS.—Early in October, 1907, I found, in a room which I use as a lumber-room, a specimen of *Gonoptera libatrix*. This room is an attic, and has a window (kept open) opening on to one of the sloping sides of the roof. In it I keep empty boxes, picture cases, &c., and also my boxes containing larvæ and chrysalids. Wishing to observe the movements, if any, of hibernating moths, I put the *G. libatrix* into a gauze-covered box. Shortly afterwards I received definite orders to move to Aldershot on a certain date. Not wishing to take the moth with me, I waited until there came a warm moist evening, when I took it down stairs (two flights) and turned it out into my garden, which is on the opposite side of the house to the attic window. Some ten days after

turning the moth outside I began turning over my picture-boxes, preparatory to packing up, when, to my astonishment, there on a lid of a case which had been resting against the attic wall was the *libatrix*, back again! There was not the slightest doubt about its being the same moth. It was a perfect specimen, very clearly marked, only it had a large peculiarly shaped chip out of its left upper wing, which I had noticed when I first took the moth, and which I have seen almost daily for a fortnight, as I used to look at the moth in the evenings to see if moved according to the weather. I again put the moth outside, this time through the attic window. About a week after doing so I took all my picture-boxes out of the attic. On taking off the loose lid of the box where the moth had been, I discovered the same moth again, sitting on the same lid! I must explain that the lids and boxes were not attached, but were all placed in a pile resting against the wall, so there was plenty of room for the moth to creep inside the box on to the lid. This particular box, that the moth had twice selected, was of walnut-wood; the others were of deal. The insect might certainly have easily selected the same box twice, once it had entered the room, but how did it manage to find its way from the garden to the attic window round the other side of the house the first time I turned it out? There can be no question about its having been the same moth each time from the peculiar mark I have mentioned. At Camberley, about three years ago, I noticed somewhat the same thing. A specimen of *Gonepteryx rhamni* hybernated on the upper side of a leaf of a thick laurel-bush in my garden. The insect was not snowed on, as upper leaves protected it, but it certainly must have been frozen several times. It was quite visible to anybody standing near the bush, and who knew where to look for it. One day early in spring, when it was bright and sunny, my wife and I were in the garden near the bush, when the butterfly started off and flew about the garden. It then disappeared over a hedge. I saw it fly back and up and down several times in our garden. I then went away, and on returning about 4 p.m., on passing the laurel-bush, there was the insect back again, within six inches of its original resting-place! There it remained until spring really came, when it finally flew away. Of course I cannot vouch in this case that it was the identical butterfly, as there were no special marks on it, but the facts of the case all go to show that it was the same one.—(Capt.) B. TULLOCH; K. O. Yorkshire L. I., November 20th, 1907.

THE RAYNOR COLLECTION OF BRITISH LEPIDOPTERA.—From marked catalogues kindly lent by Mr. A. J. Scollick we are enabled to note some of the prices realized at the distribution of this collection, which was exceedingly rich in varieties of *Abraxas grossulariata* and a few other species.

First day's sale (October 22nd):—*Sesia culiciformis*, a specimen with extra orange band at base of the body ("var. or n. sp.?"), sold for 50/-. A lot of nine specimens each of *H. jacobæ* and *C. dominula*, one of the former a variety with costal streak and apical spot united, brought in 32/6. Four nice varieties of *P. plantaginis* made 20/-, and a specimen of *A. villica* with dusky hind wings went for 26/-. Another example of *A. villica* with a large cream-coloured blotch covering apical

third of fore wings realized 27/6. Four unusually dark varieties of *A. caia*, sold in couples, made 22/- and 24/-. Of *Spilosoma lubricipeda*, "a remarkable fine rayed var. near *deschangei*," commanded three guineas, whilst a rather smaller and darker specimen only fetched 22/-; a fine example of var. *zatica* made 40/-, and one of var. *deschangei*, "entirely black, except thorax," 35/-. A pair of *Lalia cænosa* found a purchaser at 35/-, and a specimen of *Leucodonta bicoloria*, taken by Bouchard at Killarney, induced bidding up to £4 10s. Two specimens, male and female, of *D. sicula* produced 25/-. For some female varieties in a lot of ten specimens of *A. prunaria* there was competition, and these ultimately fell to the buyer of Bouchard's *bicoloria*, for £3 5s. A dark male of the same species, and a female with the outer half of the fore wings orange, brought in 32/6. A light orange female with the base of the fore wings and the anal angle of the hind wings slightly fuscous realized £2 5s.; an almost unicolorous brown male specimen made £3 15s.; two pairs of very large speckled varieties made three guineas per pair.

Of *Abraxas grossulariata* var. *lutea*, four specimens sold for from 28/- to 55/-, the total realized for the four being £8. Twenty other modifications of the same form made an average of about 5/6 each. One female specimen of ab. *nigrolutea* fetched 95/-, and another £6 10s. Three male examples of var. *fulvapicata* made 30/-, 32/6, and 60/- apiece; two females of the same, 21/- and 24/-, and five others from 7/- to 12/- each. Other tall prices for varieties of *A. grossulariata* were: a specimen of ab. *albomarginata*, 65/-; two of ab. *subviolacea*, 50/- and 55/-; a female of ab. *lactea sparsa*, 110/-; one of ab. *hazeleensis*, 40/-; three examples of ab. *nigrosparsata*, 45/-, 60/-, and 115/-. Some very nice examples of the *nigrosparsata* and other forms sold at more ordinary prices—from 5/- to 10/-. *Cidaria picata* var. *lacteo-marginata* made 20/-. Among the *Strenia clathrata* were several dark and other interesting aberrations. Eight of the most fancied of these realized £13 16s. 6d., the prices ranging from 20/- to 57/6 each. Some of the less conspicuous but still desirable aberrations went for about a shilling apiece.

The following were the more striking items in the second day's sale (November 5th):—*Leucania flavicolor*, 5/- and 5/6 each; var. *rufa*, 6/6, 7/-, and 9/- each; var. *obscura*, 16/-. Two bred specimens of *L. vitellina* realized 26/-. Three examples of *Caradrina exigua* made 18/-, and the same price was given for each of two specimens of *C. xerampelina* var. *unicolor*. Of *Cucullia gnaphalii* there were six specimens, and these brought in a total of £3 7s. Six *Plusia orichalcea* sold for 12/-, and two specimens of *P. bractea* for the same amount. A nice little collection of Deltoids and Pyralidæ, offered in six lots, and comprising well over seven hundred specimens, only produced 33/-, whereas sixteen *Stenoptilia graphodactyla* (a recently discovered plume-moth) made 48/-. Seventy-six varieties of *Abraxas grossulariata* realized the large total of something over £100. The highest prices obtained being var. *chalcizona*, £4 10s.; var. *lacticolor*, £5 15s. and £4; var. *chalcobares*, £6; and var. *melanozona*, £6 10s.

CAPTURES AND FIELD REPORTS.

NOTES ON *NYSSIA LAPPONARIA*.—During the past two seasons I have been rather fortunate in finding nice long series of this rather local species along the Struan Road on the way to Kinloch. The moths are to be found in four different places along the road where bog-myrtle is abundant. I have obtained them near Blair Atholl, also about two hundred feet above the road on boggy parts of the hills, but I never found them away from bog-myrtle, and this would go to prove that this plant is the usual food of the larvæ. Two weeks after I had ceased collecting them, a young man in Kinloch started to look for them, and he had got a fair lot. He did not say what he did with the males; but he had a box with about fifty females, which I gave him two shillings for. I then put them down on new ground; in fact, if this species is not removed away from Struan Road it will be ruined, as everyone about the place has come to know of it. A man put a box of them into the river at Kinloch, and no doubt the moths will be scarce on the Struan Road next year. Fortunately all the spots for *N. lapponaria* in this district are not generally known. If I visit the locality next season, I think it would not be wrong of me to take all the females I can get on the Struan Road to safer ground, as it would be a pity to have this local species destroyed.—L. G. ESSON; 383, George Street, Aberdeen.

LEPIDOPTERA ON THE KENTISH COAST IN 1907.—I made a short visit to the Kentish coast in the vicinity of Deal on July 25th last, and found Noctuæ in some numbers at sugar on the sand-hills; this was particularly the case with *Xylophasia sublustris*, of which species I counted sixteen on one sugared post, and over one hundred on my first round. They were accompanied by *Agrotis corticea*, *Miana literosa*, *X. monoglypha* (*polyodon*), and other common species. At the *Echium* flowers I saw *Agrotis vestigialis* and *tritici*, and also secured a nice series of *Nyctegretes achatinella*; the latter sitting quietly on the flowers allowed themselves to be boxed without trouble. *Lithosia luturella* (*pygmæola*) were flying somewhat freely for them, the evening being warm, with only a slight breeze; but having met with this insect in plenty in the same locality in 1898, I did not work for them. On the following day I explored the sand-hills for a considerable distance, and was delighted at meeting with *Acidalia ochrata* for the first time alive. A few were taken, and two worn females deposited ova freely. The larvæ emerged during the first week in August. I gave them *Galium verum* flowers to begin with, and when these could no longer be obtained, they took to the flowers of the golden-rod, a plant which I had fortunately growing in the garden. A fair number of the larvæ are alive, and I hope to find them in the same condition after hibernation.—G. H. CONQUEST; 10, Meteor Road, Westcliff-on-Sea, October 29th, 1907.

ACIDALIA STRIGILARIA AT FOLKESTONE.—On July 24th, 1906, I had the good fortune to capture in Folkestone Warren a single female specimen of *Acidalia strigilaria*. She laid a few ova, and from these I reared nine perfect imagos in July of this year. They were fed

throughout on *Clematis vitalba*, and I found them easy to rear. I understand this interesting insect is much rarer than formerly in the Warren, which is, I believe, its only known locality in the British Islands.—G. H. CONQUEST; Westcliff-on-Sea, October 29th, 1907.

WYE VALLEY NOTES. CAPTURE OF *XYLINA FURCIFERA* (CONFORMIS).—Last Easter, having decided to renew my acquaintance with the Wye Valley, I travelled to Chepstow on the evening of March 28th, and on the following day (Good Friday), there being no trains running on the Wye Valley line, walked the eleven miles to my quarters near Bigsweir. My chief object in visiting the district was to get some females of *Vanessa c-album*, and in this I was not disappointed. During Friday I saw four specimens of the butterfly, and captured one, and in the course of the next three days a fair number were seen, and three more taken. The species seems to be fairly well distributed up the valley from Chepstow to Monmouth. *Vanessa urtica* was common everywhere; *V. io* and *Gonepteryx rhamni* rather less so. Of *V. polychloros* I saw two, both on the Gloucestershire side of the river. *Brephos parthenias* and *B. notha* were both taken in small numbers by watching in open spaces, as they fly low in such situations, and have a somewhat weak and fluttering flight.

The weather remained so hot just at this time that *Pieris rapæ* was seen on March 31st, and several *P. napi* and *Euchloë cardamines* (males) on the following day. A large number of willow bushes were visited on the three evenings of my stay, but a clear sky and a full moon prevented anything like a large bag. The scarcity of insects was, however, more than made up for by the capture of a male *Xylina furcifera* (conformis) on the 31st, which for a spring specimen is in very good condition. The identification of the specimen has been kindly confirmed by Dr. T. A. Chapman. A fine male *Pachnobia leucographa* was also taken on the same evening. Other species noticed at willows were: *Taniocampa gothica*, *T. incerta*, *T. stabilis*, *T. pulverulenta*, *Cerastis vaccinii*, *Scopelosoma satellitia*, and *Hybernica marginaria*.

On my return home I sleeved two of the *Vanessa c-album* on a currant bush, and put two in a cage with a supply of nettle-leaves. One of the former soon died, owing, I think, to one or two cold nights experienced just then, so I placed the survivor in the cage with the other two. A few ova were laid on April 2nd, and more at intervals on sunny days, until there were about one hundred in all. Some of these I distributed amongst friends. Of those I kept the first hatched on April 25th, and the last on May 28th. By June 8th two larvæ were hanging up, and the first pupated two days later. Thirty-five larvæ reached the pupal state, and from these I bred thirty-four perfect specimens, the remaining one being slightly crippled. The pupæ were kept indoors, and the butterflies emerged between June 23rd and July 23rd. A small portion were of the var. *hutchinsoni* form, and there is a good deal of variation in the under sides. I attempted to get a pairing in confinement in a large breeding-cage, but was not successful.

At Whitsuntide I again went down for a few days (May 17th–20th),

but was not so fortunate in regard to weather. It was decidedly colder, especially at night, than it had been at Easter. By working along the railway and river-banks I secured a fair number of *Euclidia glyphica*, and also observed *Argynnis euphrosyne*, *Nisoniades tages*, *Syrichthus malvæ*, *Lycæna icarus*, *Euchloë cardamines*. A few strongly-marked *Pieris napi* were netted, but were all males.

By beating and searching, odd specimens of *Abraxas ulmata*, *Venilia maculata*, *Minoa murinata*, *Melanippe hastata*, *Ennychia octomaculata*, and others were taken. After dark I used to tramp the woods with an acetylene lamp, but captures were very few and far between, and only included such things as *Numeria pulveraria*, *Tephrosia punctularia*, *Cidaria suffumata*, *Epione advenaria*, and others not worthy of mention.—PHILIP J. BARRAUD; Bushey Heath, Herts, November 9th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, November 6th, 1907.—Mr. E. Saunders, F.R.S., Vice-President, in the chair.—Mr. G. Arnold, University of Liverpool; Mr. H. Frederick D. Bartlett, of 113, Richmond Park Road, Bournemouth; Mr. John Claude Fortescue Fryer, B.A., of The Priory, Chatteris; Mr. C. W. Howard, of the Acting Government, Transvaal; Mr. Charles H. Mortimer, of Wigmore, Holmwood; Mr. R. F. H. Rosenberg, of 57, Haverstock Hill, London, N.W.; Mr. Harold Baker Sly, of Brackley Knoll Road, Sidcup, Kent; and Mr. Clement H. Pead, of Johannesburg and St. Leonards Road, Bexhill-on-Sea, were elected Fellows of the Society.—Mr. A. H. Jones brought for exhibition a specimen of the Longicorn beetle, *Acanthocinus ædilis*, L., a common Rannoch species, found in Gray's Inn Road.—Dr. F. A. Dixey exhibited male and female specimens of a new *Pinacopteryx*, discovered by Mr. S. A. Neave in Northern Rhodesia. The female resembled that of *P. rubrobasalis*, but the male was quite distinct. Both sexes of *P. rubrobasalis* and the female sex of Mr. Neave's species were mimics of *Mylothris agathina*.—Mr. W. G. Sheldon showed a series of *Limenitis populi* and *ab. tremula* with intermediate forms taken this year at Laon (Aisne), and a series of *Chrysophanus hippothoë* from the same region, the females displaying a wide range of variation for so restricted a locality as that in which they were captured.—Mr. G. C. Champion exhibited a fully developed example of *Mesovelia furcata*, M. & R., from Slapton, S. Devon, and *Thamnotrizon cinereus* from Lynmouth, N. Devon.—Mr. A. Harrison and Mr. Hugh Main exhibited a case of *Aplecta nebulosa*, arranged to show the great range of variation of this species in Delamere Forest; with series from Epping Forest, North Cornwall, and the New Forest for comparison.—Mr. R. S. Mitford exhibited two male specimens of *Cryptocephalus bipunctatus*, taken by him at Niton in the Isle of Wight in July, 1907, Undercliff, observing that the two forms were well-known on the Continent, but that neither had been reported in Britain before. He also showed *Paracynus æneus*, Germ., captured on the North Essex coast in June, 1898, thus establishing the claim of *P.*

æneus to be regarded as a British beetle; an example of the very rare *Lathrobium rufipenne*, taken by him at Niton, I. W., in July, 1906; and a specimen of the rare *Ceuthorrhynchus viduatus*, taken by him at Brading, I. W., in July, 1907; and a specimen of *Cis dentatus*, taken by him at Sandown, I. W., in July, 1906, hitherto unrecorded in Britain.—Mr. J. E. Collin communicated a paper “On a large series of Nycteribiidæ, parasitic Diptera, from Ceylon.”—Dr. G. B. Longstaff, M.D., then read a paper “On some Butterflies taken in Jamaica,” and a paper “On some Butterflies of Tobago,” exhibiting a number of examples taken by himself in both localities to illustrate his remarks.—H. ROWLAND-BROWN, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 10th, 1907.—Mr. R. Adkin, F.E.S., President, in the chair—Dr. Chapman exhibited a specimen of *Dasychira pudibunda* from the Pyrenees, measuring $2\frac{3}{4}$ in. in expanse.—Mr. Moore, *Hipparchia semele* showing considerable variation in ground colour on the under sides, and a small race of *Enodia hyperanthus*, both from Dunkirk sand-dunes, together with an example of *Danaïs plexippus* from Moose Jaw, Winnipeg.—Mr. Lucas, the rare fungus, *Clavaria inæqualis*, from Oxshott, and the specimens of *Hyles euphorbiæ* bred recently from pupæ found in Kew Gardens.—Mr. Tonge, *Ennomos fuscantaria* taken by him at Redhill on his way to the meeting.—Mr. L. W. Newman (1) a series of bred *Polia xanthomista* var. *nigrocincta* bred from N. Cornwall ova; (2) ova of *Ennomos fuscantaria* and *Cirrhædia xerampelina* in situ on ash twigs; (3) a long series of *E. autumnaria*, including a number of very fine bred dark brown forms.—Mr. Priske, a series of the local *Necrophorus mortuorum*, and an exceptionally large *Lucanus cervus*.—Mr. Adkin, a series of *Hyponomeuta cagnagellus* reared from an *Euonymus* shrub in his garden, and contributed notes; he also showed ova of *Tortrix pronubana*.—Dr. Hodgson, a *Theretra porcellus*, brilliantly coloured on the right side; while the left was only faintly coloured, and also a varied series of male and female *Polyommatus icarus* from Kent, Surrey, and Sussex.—Dr. Fremlin, two fine varieties of *Aglais urticae*, of the same race as those previously shown by Mr. Newman.—Mr. McArthur, spiders with their snare and prey, mounted between two sheets of glass.—Mr. Turner, a series of *Colias phicomene* from the Engadine; and a number of Lepidoptera from Guethery, Causerets and Gavarnie, including some extreme forms of *Pararge mæra*.—Messrs West, Tonge, Main, Dennis, and Lucas exhibited a considerable number of lantern slides.

October 24th.—The President in the chair.—Messrs. Harrison and Main exhibited a series of *Agrotis ashworthii* from larvæ collected in North Wales at Easter, including var. *virgata*.—Mr. Tonge, a series of *Calocampa vetusta* bred from Continental ova, and stereographs of the ova of *Ennomos fuscantaria* and of *Cirrhædia xerampelina* in situ on ash.—Mr. West (Greenwich), the Coleoptera, *Apion hookeri*, *A. confluens*, and *Ceuthorrhynchus rugulosus*, all taken near Erith on chamomile.—Mr. Simmons, living larvæ of *Eupithecia subfulvata*.—Mr. Main, ova of a “stick” insect, *Bacillus rossi*, which resemble a short-stalked seed.—Mr. R. Adkin, a bred series of *Melanippe galiata* from ova obtained at Eastbourne, and read notes on the variation shown.—Mr. Turner,

leaves of birch showing the web, feeding gallery, and cocoons of the Hyponomeutid moth *Swammerdamia casiella* var. *griseo-capitella*, and read notes on the larval habits. He also exhibited (1) *Melanargia galathea*, var. *leucomelas* from Gavarnie, Pyrenees; (2) *Aricia agestis* var. *alpina* from St. Moritz, Engadine; (3) *Abraxas grossulariata*, a form with but few traces of yellow, and extended and coalesced black markings; (4) several *Polyommatus icarus* ab. *clara* from Effingham; (5) *Eupithecia oblongata* ab. *centralista* (?) bred from golden-red, Woolwich; (6) dwarf *Malacosoma castrensis*, measuring only 24 mm. from Essex; and (7) *Anthrocera filipendulæ*, with the sixth spot much reduced in size and brightness and very clearly divided by the dark nervure.—Mr. Grosvenor, long series of *Polyommatus corydon* and *P. bellargus* with much variation; a specimen of the latter species was without the usual discoidal spot on the under side.—Mr. Newman (1) long series of *Hypsipetes sordidata* (*elutata*) from various localities, showing much variation, including fine red forms; (2) another gynandromorphous *Amorpha populi*; and (3) two more of the abnormal race of *Aglais urticæ*. He also recorded the occurrence in North Kent of black aberrations of *Oporabia dilutata* and *Cheimatobia brumata*.—Mr. Sich read a paper, "Collecting Lepidoptera on the Tannusberg." HY. J. TURNER, Hon. Rep. Sec.

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — October 1st, 1907. — Mr. H. M. Edelsten exhibited *Leucania turca*, bred from Brentwood ova; also ova of *Nonagria cannae*, in situ, on *Typha*, the female being provided with special hooks enabling it to lift the natural folds in the cuticle and deposit the ova underneath.—Dr. G. G. C. Hodgson, *Meitæa artemis*, showing parallel variation in widely separated districts, such as Central Ireland and South Wales, Devon and South Wales, &c.; also sketches of *Hesperia thaumas* observed resting in the sun in the position assumed by *Thanaos tages* when at rest at night, and blooms of the lizard orchis found in Surrey.—Mr. L. W. Newman, a very variable series of *Vanessa urticæ*, including specimens with the black costal blotches confluent.—Mr. L. B. Prout, *Dianthæcia luteago* var. *jicklini*, bred July 3rd, 1907, from larvæ found near Bude, end of July, 1906, feeding on roots of *Silene maritima*.—Mr. J. Riches, *Agrotis puta*, from North London, with fore wings suffused with dark brown.—Mr. L. A. E. Sabine, *Polia nigrocincta*, bred from North Cornwall larvæ reared on apple and sallow.

October 15th.—Mr. J. A. Clark exhibited *Bombyx callunæ* male from Dulnaith Bridge, with usual pale bands suffused with brown ground-colour.—Mr. H. M. Edelsten, a dark red-brown form of *Cenobia rufa* from Dorset.—Mr. T. H. L. Grosvenor, *Lycæna alexis* from Surrey and Aberdeen, those from the latter district being the larger, and being more intense in colour.—Dr. G. G. C. Hodgson, *Lycæna alexis* taken during 1907, showing an unusually large proportion of blue females.—Mr. A. W. Mera, *Himera pennaria* male, Brentwood, 1907, with bands on fore wings very close together and only faintly indicated.—Mr. L. W. Newman, *Ennomos autumnaria* bred from ova laid by typical female paired with melanic male from Dover, a fair number of the series being melanic; also a very large *Polia xanthomista*, bred from North Cornwall ova.—Mr. L. B. Prout, *Toxocampa cracca* from

North Cornwall and North Devon, 1907, all being of the grey form, and showing no trace of the brownish coloration characteristic of specimens taken some years ago in the latter district.—Mr. R. G. Todd, a long series of *Nonagria arundinis*, Wicken, mid-June, 1907, Mr. C. J. Willsdon, *Leucania vitellina*, *L. putrescens*, and *Heliothis peltigera*, Torquay, 1907; also, on behalf of Mr. E. C. Goulton, a long and extraordinarily variable series of *Hypsipetes elutata*, bred from Surrey larvæ.—S. J. BELL. *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The opening meeting of the session was held at the Society's rooms in the Royal Institution, Liverpool, on October 21st, Mr. Wm. Mansbridge, Vice-President, in the chair.—Mr. A. E. Gibbs, F.L.S., F.E.S., of St. Albans, was elected a member of the Society.—This being the annual exhibitory meeting, many interesting insects were brought by the members.—Mr. B. H. Crabtree had a fine series of the local melanic form of *Boarmia repandata* from Penmaenmawr, the females especially showing the white blotches characteristic of this local race; *B. gemmaria* var. *perfumaria* from Manchester; varieties of *Angerona prunaria* from Monkwood; *Aplcta nebulosa* var. *robsoni* from Delamere Forest; *Agrotis ashworthii* from Penmaenmawr; and *Chariclea umbra* from Sidmouth.—Mr. Robert Tait, Jun., showed a number of local species, among them being a long series of *Agrotis ripæ* from South Wales coast; *A. ashworthii*, North Wales, a series captured at rest; *Hemerophila abruptaria*, the chocolate form, from the London district; *Lobophora viretata*, *Anticlea derivata*, and *Larentia salicata*, from Lake Side, Westmorland; *Dianthæcia nana* and *Eupithecia jasionæata* from Abersoch.—Dr. William Bell had a drawer of beautifully preserved and mounted larvæ of Lepidoptera, in which he had been able to preserve the green coloration in such species as *Saturnia pavonia* and *Papilio machaon*, without recourse to artificial aid. Dr. Bell had also been able to dry the plants on which the larvæ were mounted, in their natural form and colour. The same member further exhibited a box of Wicken insects, which included *Spilosoma urticæ* and an example of *Tapinostola extrema* (concolor) from that district; varieties of *Arctia caia* and a dark specimen of *Ennomos alniaria* from Wallasey; and *Plusia moneta* from Surrey.—Mr. F. N. Pierce brought a drawer of minor varieties of *Abraxas grossulariata* from Wallasey.—Mr. Prince had a large number of insects representing his season's work at Wallasey and Witherslack, and contributed notes.—Mr. W. Mallinson showed a beautiful water-colour drawing of a larva of *Deilephila galii*, one of two found at Wallasey this year.—Mr. H. R. Sweeting exhibited *Lycæna bellargus* and var. *cærulea* from Eastbourne; *L. corydon* and var. *syngrapha* taken by himself in Surrey; a series of *Noctua castanea* and var. *neglecta* from Delamere; *N. glareosa* and *N. brunnea* also from Delamere; *Moma orion* from the New Forest.—Mr. W. Mansbridge, a long bred series of *Boarmia repandata* from Delamere; a bred series of *Odontopera bidentata* from Wakefield, including var. *nigra* and diaphanous specimens; series of *Nyssia lapponaria*, *Anarta melanopa*, and *A. cordigera*, from Rannoch.

The usual monthly meeting of this Society was held in the Royal Institution, Colquh Street, Liverpool, on November 18th, Mr. Wm.

Mansbridge, F.E.S., vice-President in the chair.—A lecture was delivered by Mr. F. N. Pierce, F.E.S., on "The Androconial scales of Butterflies." He explained that these scales were only found upon the males of the various species and were even in that sex uncertain. The lecturer instanced the entire absence of this kind of scale in the case of the large group of the Lycænidae, in such species as had brown males. Mr. Pierce described a hitherto unobserved scale which he had discovered when examining the male of the brown argus butterfly (*Lycana agestes*) which appeared to be not only confined to the "blues" but to a very small patch, consisting of a few of these new scales, on the under side of the fore-wings, at the extreme base of the inner margin. He also enumerated some of the theories put forward from time to time as to the utility of these androconials. The lecture was fully illustrated with micro photos of the actual scales, shown through the lantern. This very entertaining lecture was followed by a lengthy discussion, in which most of the members present took part. The following members exhibited Lepidoptera.—Mr. F. N. Pierce, specimens of the British Lycænidae in illustration of his paper.—Mr. Wm. Mansbridge, a short series of *Pygæa curtula* from Ireland, one specimen showing failure of the brown scales at the tips of the fore-wings.—Mr. H. R. Sweeting bred series of the following from Delamere:—*Geometra papilionaria* and *Ellopia prosapiaria*; the latter showing the dusty greyish suffusion characteristic of the locality.—Dr. J. Cotton exhibited a lantern slide of several British Rhopalocera photographed by Lumière's recently perfected process—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 21st, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Arrochar Lepidoptera: Rev. C. F. Thornevell showed various Lepidoptera collected at Arrochar this year, including *Larentia tristata*, L., two specimens of a nice form, with cream-coloured ground and coffee-coloured markings. He said that in daylight the markings had quite a golden tinge. The extent of the markings was normal, excepting that the central band was restricted; there were also *L. adæquata* Blich. (*blandiata*, Hb.), and an unrecognized *Eupithecia*. *Bryophila*.—Mr. G. T. Fountain showed a long series of *perla*, F., and *muralis*, Forst., from many British localities, to illustrate the extent of their variability.—Gynandromorphs: Mr. Colbran J. Wainwright showed two specimens of *Platycheirus albimanus*, F., from Sutton Park, which were quite extraordinary. They were melanic, one showing no trace of markings, and in different degrees they showed characters intermediate between those of the male and the female sexes. Strictly speaking, they were not gynandromorphs, as they did not display some parts with male characters, and other parts with female characters. They would be better described as females possessing certain characters approaching those normally possessed only by the males. The chief points were that the foreheads, though separated, were only half the width of those in normal females, and were similar to males in some details of form: the fore tarsi and tibiæ, normally single in the females, were in these widened in similar manner to those of males, but not so much (the two specimens differing much in degree). The genitalia outwardly

appeared feminine.—Palæarctic Pararges: Mr. G. T. Bethune-Baker showed a nice collection of the genus *Pararge*, with various forms of *egeria*, L., *megæra*, L., *mæra*, L., &c.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Les Premiers Etats des Lépidoptères Français (Rhopalocères). Par M. C. FRIONNET. Pp. i-xl, 1-320. Paris: A. Hermann.

THE ever-increasing number of collectors who find an extended field for observation and capture in France will welcome a book dealing practically with the subject chosen by M. l'Abbe C. Frionnet. It is a pity, therefore, that the author had not confined himself entirely to the species indigenous to the titular region, instead of introducing those wholly outside it, or of accidental occurrence. He does not appear, moreover, to have had the advantage of referring to records of much of the good work in his special department done by British observers, and although the species—and they are many—which have actually passed through his hands are as fully described as purposes of identification require, M. Frionnet, for the rest, is content to copy from his predecessors, in several cases with indifferent results. We should have expected a better diagnosis and account of the early stages of *Lycæna arion*, for instance, than the fragmentary information quoted from Newman. Nor do we find more than the barest mention of the association of ants with the larvæ of Lycænid butterflies, without some note of which their life-history must necessarily remain imperfect and unintelligible. Neither *Neptis lucilla* nor *N. aceris* have established themselves west of the Alpes-Maritimes: an extremely doubtful record of Peyerimhoff's for Strasbourg is regarded as sufficient warranty for a transcription of *Vanessa xanthomelas*. According to M. Chrétien ('Le Naturaliste,' 1903, pp. 71-2), the larvæ of all the Erebiidæ except *E. pronœ* are known, but M. Frionnet is unable to furnish details of *mnestra*, *pharte*, *stygne*, *evias*, *scipio*, *epistygne*, *goante*, *gorgone*, or *gorge*. But we know how difficult it is to get thoroughly accurate descriptions, and in the search among local lists to light upon reliable records. The French catalogues, hidden away in the annals of Societies of mixed scientific aims, are generally most difficult of access. Large tracts of country, even in the most promising regions, have yet to be explored by native butterfly-hunters so far as we can gather. At least in periodical entomological literature they have left no trace of their excursions. It was hardly worth while, however, to recreate *Apatura metis*, Fr., into a species, and simply to mention that the larva resembles that of *A. ilia*; and for localities which should appeal most strongly to British collectors there are some very improbable entries retained, as it were, from the veritable "fathers of entomology." If *Argynnis pandora* ever occurred at Auxerre, in the midland department of the Yonne, it was surely introduced artificially; while the record from Cherbourg, an error of M. Nichollet's, was corrected long ago. And is it conceivable that a southern species like *Euchloë belemia* ever found its way, except out of a collector's box, to Morlaix, in Finistère, a department which, by reason of

its geographical position, possesses one of the poorest butterfly faunas in France? But apart from these unnecessary repetitions, M. Frionnet condenses much useful and new matter into the two hundred and thirteen notices which more than cover the splendidly diverse catalogue of France's butterflies, and we may hope that the tempting array will further encourage those who enjoy the opportunity of studying them at first-hand to supplement our knowledge alike of their earlier stages, and of the area of their distribution in Western Europe.

H. R.-B.

Some Moths and Butterflies and their Eggs. Gowan's Nature Books, No. 15. Pp. 8, 60 plates. London and Glasgow: Gowan & Gray.

We have here a little book, 6 in. \times 4 in., in paper cover, intended for the general public, but requiring notice also amongst entomologists. We have photographs of sixty species of Lepidoptera and their eggs, by Mr. A. E. Tonge, reproduced in half-tone, as perfectly as we are accustomed to see such work in our best Transactions and magazines. The half-tone process does not reproduce the minute sculpture of the eggs, as one would like, but it shows as much as one can see of the egg itself by aid of an ordinary hand-lens. We can detect nothing that is not scientifically accurate, and we admire the portraits of not a few of the imagines. The remarkable point about the book is its price, so much and such good material got up for sale amongst entomologists would probably be sold at 5s. or 10s. Here it is for 6d. The secret is that it is to be sold by the thousand on bookstalls and elsewhere. If we could make the usual scientific works as popular, we might get them as cheaply. Will this suggest to anyone to think furiously with practical result?

T. A. C.

The Story of Insect Life. By W. PERCIVAL WESTELL, F.L.S., M.B.O.U. Pp. 1-339. London: Robert Culley, Paternoster Row, E.C. 1907.

THE first of the seven chapters into which the author has divided his subject comprises general remarks on the structure, metamorphosis, habits, &c., of insects. Chapters ii.-vi. deal respectively with Coleoptera, Orthoptera, Neuroptera, Hymenoptera, and Lepidoptera. The seventh and last chapter is devoted to Hemiptera and Diptera. Only some of the commoner species in each order are referred to, and these are just those insects that are most likely to come under the notice of rural dwellers or country rambles. There are fifty figures of insects on the eight coloured plates, and a further sixty-two in black and white. Only ten species are shown in the larval stage, and of the egg stage we only find three examples. The story is pleasantly told, most of the illustrations are well done, and altogether the book is distinctly attractive.

OBITUARY.—We regret to learn that Mr. A. H. Shepherd, of 81, Corinne Road, died on October 26th last.

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Great deeds are done and great discoveries made.”

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NEW ORIENTAL PAPILIONIDÆ.

BY THE HON. L. W. ROTHSCHILD, Ph.D., F.E.S.

1. *Troides goliath atlas*, subsp. nov.

♀. The cell-patch of the fore wing separated into spots; there are three white spots in front of the second median vein on the under side of the fore wing, the females of the other forms of *goliath* having less than three spots between the two median veins. The disc of the hind wing is greyish white above, and densely dusted with black, being on the under side white proximally and yellow distally.

Hab. Kapaur, Dutch South-west New Guinea. Two females collected by W. Doherty in January and February, 1897.

2. *Troides priamus arruanus*, Feld. (1859).

I have now a better series of Arru specimens of *T. priamus* than in 1895, when I published the Revision of Eastern Papilios, and am inclined to treat them as representing a separate subspecies, although only the majority of the individuals differ from New Guinean ones. Among my specimens there is a very remarkable variety of the male, which I think should be recorded under a name of its own:—

♂ *ab. chrysophila*, nov.—Hind wing, on upper side, without black spots, but instead with four brown submarginal ones, of which the upper three are centred with gold; behind the costa a large golden spot. On under side these spots enlarged, also the fourth submarginal one being centred with gold; the fore wing much more extended green than in ordinary specimens, the black distal band being only represented by a spot situated in the subcostal fork. Length of fore wing only 70 mm.

3. *Troides brookiana natunensis*, subsp. nov.

♀. Intermediate between *albescens* from the Malay Peninsula and *brookiana* from Borneo. Nearest to the latter, but the white markings larger.

Hab. Burguran, Natuna Islands.

4. *Troides hypolitus antiopa*, subsp. nov.

♂. The light stripes along the veins of the fore wing less distinct on the upper side than in the specimens from the Southern Moluccas. On the under side the second yellow spot of the hind wing is posteriorly produced, the white spot placed before the second radial vein is very small, the black one situated below the third radial large.

Hab. Northern Moluccas: Morty (=Morotai); also Halma-hera (Wallace).

5. *Troides haliphron ariadne*, subsp. nov.

♂. Collar and sides of breast red, the posterior ventral segments of the abdomen edged with yellow. The vein-stripes of fore wing purer white beneath than in *iris*, Rüb. (1888).

♀. Collar and breast as in male. The cell-spot of the hind wing larger than in *iris*, as are also the yellow spots situated before the first radial and behind the second median veins.

Hab. Roma.

6. *Troides oblongomaculatus asartia*, subsp. nov.

♂. Similar to *T. o. hanno*, Fruhst., from Goram. Cell-spot of hind wing extending close to the base; the subcostal spot as in *oblongomaculatus*, or smaller; the yellow patch situated below the cell reaching on under side almost as far distad as the spot situated in front of the second median vein, the cell more thinly edged with black than in *hanno*, the lobes of the black marginal band shaded with yellow, the last lobe much reduced, a small dot being separated from it; this dot absent from one of our specimens.

Hab. Ceram Laut, December, 1898 (H. Kühn). Three specimens.

7. *Troides oblongomaculatus bandensis*, subsp. nov.

Both sexes smaller than *T. o. oblongomaculatus*, with the abdomen deeper blackish brown on upper side.

♂. Hind wing rather more rounded than in *T. o. oblongomaculatus*; the yellow cell-spot large, proximally excised; the upper tooth of the third golden patch not or very little more projecting than its lower tooth; on the other hand, the yellow area more strongly produced at the first median vein than usual.

♀. Fore wing above with sharply defined greyish white vein-streaks; the subcostal streaks, and to a less extent also the others, much shaded with black distally, not extending so close to the edge as in striped females of *oblongomaculatus*; cell edged with greyish white, forming a kind of M, the cell being sharply margined with white also beneath; the stripes situated at the second median and the submedian much shaded with black. The yellow area of the hind wing above deeper yellow than in *oblongomaculatus*, beneath as pale as in that subspecies; there is always a yellow spot before the first radial, and a large one below the cell; the fringe-spots very narrow above and below.

Hab. Great Banda. A series, mostly collected by H. Kühn in November and December, 1898.

8. *Troides helena neoris*, subsp. nov.

Abdomen much paler above than in *hephæstus*, being yellowish brown, with the sides and under surface grey.

♂. Fore wing with very feeble vestiges of light streaks on the under side; the distal margin somewhat more incurved than in *hephæstus*. The black marginal band of the hind wing as broad as in extreme specimens of *hephæstus*, being much broader than in the Malayan forms of *T. helena*.

♀. All the veins of the fore wing, inclusive of the submedian, accompanied by very broad greyish white streaks, the streaks situated at the second median vein being remote from the cell; the apical third of the cell greyish white above, with two blackish streaks, beneath almost pure white. Golden cell-spot of hind wing proximally almost cut off straight; no yellow discal spot in front of the subcostal vein, the black marginal band broader than in *hephæstus*, and the fringe-spots larger. Beneath the central area of the hind wing yellowish grey, being more distinctly yellow in the centre.

Hab. Binongka, Joekan Bessi Islands, south-east of Celebes. One pair, collected by H. Kühn in December, 1901.

9. *Troides helena mopa*, subsp. nov.

♀. Intermediate between *neoris* and *hephæstus*. Abdomen more yellow than in *neoris*, with small black spots on the under side. Fore wing as in strongly striped females of *hephæstus*. The black distal margin broader than in *hephæstus*; the central area on the under side as pale as in *neoris* at its anterior basal and posterior sides, the area being the same as in *neoris*, except that a much larger portion is yellow.

Hab. Buton, south-east of Celebes, December, 1901 (H. Kühn). Only one specimen.

10. *Troides helena antileuca*, subsp. nov.

The abdomen as black above as in *sagittatus*, not being so distinctly pale in the centre as in *helena* from Java.

♂. Fore wing entirely without light stripes on both sides. Hind wing as in *helena*; no golden discal spot before the subcostal vein.

♀. Fore wing above without grey vein-streaks, the cell also not being edged with grey; beneath the light vein-streaks faintly vestigial. Hind wing with a discal and a submarginal golden spot in front of the first radial vein, both being small; the golden spot situated behind the cell almost extends to the base; the black discal spots moderately large; the golden cell-patch cut off in the direction of the first radial.

Hab. Kangean Islands. One pair (Prillwitz).

11. *Troides helena isara*, subsp. nov.

♂. Similar to Sumatran specimens of *T. helena*; the differences not constant. The grey vein-stripes of the fore wing usually indistinct on upper side, always very distinct beneath. The yellow spot

situated before the subcostal vein of the hind wing large, as is also the one placed below the cell.

♀. Resembling *neréis* from Engano. Fore wing with sharply marked whitish grey vein-streaks, the streaks at the submedian vein broader and purer whitish grey than in Sumatran specimens, there being also two thin stripes at the submedian fold; the apex of the cell whitish grey as far down as the first median vein, the patch including two black streaks. The yellow area of the hind wing beneath paler than in Sumatran specimens, but deeper yellow than in *neréis*.

Hab. Nias. A series.

12. *Troides helena typhaon*, subsp. nov.

♂. Fore wing above without grey vein-streaks, these streaks beneath often distinct, in this case there being a whitish subbasal streak behind the median nervure. The golden subcostal patch of the hind wing always large, extending distally to the costa.

♀. Apex of cell of fore wing above edged with greyish white, this border being wider in front than behind, not being so distinctly M-shaped as in *cerberus*; the vein-stripes narrower than in *helena*, generally well developed above and beneath, those which are situated at the subcostal and discal veins extending to the cell. The black discal spots of the hind wing often very large and confluent (especially in specimens from the hills).

Hab. North-east Sumatra. A series.

13. *Troides helena spilotia*, subsp. nov.

♂. The vein-stripes of the fore wing distinct above and below, especially those which accompany the median veins; beneath there is a long and broad streak before the submedian vein, the streak situated behind the second median vein being continued basad along the cell, as in *cerberus*. Hind wing with a complete row of black spots, the second being 9 mm. long.

♀. The vein-streaks of the fore wing very dark and narrow on upper side, but strongly developed on under side; apex of cell with a dark grey M. Hind wing without a yellow discal spot before the subcostal vein; the black discal spots large, the one situated behind the second median vein long, being only 5 mm. distant from the cell; the yellow area pale beneath, greyish behind.

Hab. Hainan. One male and two females.

A FEW NOTES ON SPANISH BUTTERFLIES.

By A. F. ROSA, M.D.

ALTHOUGH my visit to Albarracin in July and August, 1906, was rather late to begin with—and short enough in any case—I was successful in obtaining most of the desirable species and varieties occurring in the district about that time of year. I arrived at

Teruel on the morning of July 29th, and proceeded by the diligence to Albarracin, the journey occupying the better part of that day, the rather primitive vehicle starting about 10.30 and reaching its destination a little before 3 p.m.

I put up at the 'Posada Nueva,' and stayed till August 9th. The weather was continuously fine, very hot in the afternoons, and the wind, which was just a cool breeze in the forenoon, generally increased in strength as the day advanced.

I had an outing with Señor Narro, who pointed out some of the likely spots for *Erebia zapateri*, although none were seen on that day; and Dr. Gimeno Márquez, from Madrid, who was shooting, accompanied me once or twice. Mr. J. S. Gibson also, who was staying at Albarracin for the summer, gave me a lot of interesting information about the place, and the customs of the natives.

The following are a few notes on the local and more important species and varieties:—

Papilio podalirius var. *feisthamelii*.—Two only, taken on the right bank of the Guadalaviar.

Argynnis adippe var. *chlorodippe*.—There was no difficulty in getting specimens of this variety, as it was abundant at some parts in the Guadalaviar district, and particularly so at the outskirts of the woods at El Puerto, and mostly in good condition.

A. pandora.—Very common on the flowery banks, and in the grassy hollows along the road beside the Guadalaviar. The large females especially were very fresh, and easily secured.

Melanargia lachesis.—Was still good, and very abundant everywhere. The shading at the base of the wings, often very slight in French specimens, is in these more distinct, often well marked.

M. iapygia var. *cleante*.—Not uncommon at El Puerto, but a little difficult to pick out from *M. lachesis*. Of *iapygia*, the first seen were worn males, but later on fairly fresh females were frequent. These vary somewhat, some having very little or none of the shaded band characteristic of the variety around the eyes, hind wing; and one has the usual dark markings of upper side very pale brownish grey.

Erebia zapateri.—In and near the woods at El Puerto. The first seen August 6th, two or three only, on 7th more frequent, and on 8th very common; but only two females were obtained. On the wing it reminded me of *E. æthiops* when it is just making its appearance, the wings having such a dark, rich, velvety bloom, which is so readily tarnished; but the wings are rounder, and the patch looks nearly orange instead of mahogany, and it is larger and more uniform. There is sometimes a third spot besides the two apical, as in *æthiops* (two males and the females). The species is generally described as having upper side hind wings "uniform brown without spots or markings," or "hind

wings without eyes"; but this is hardly the case, because of thirty males only one is without markings; the others have a rusty patch. In five this patch contains a black spot, and in eight cases a black spot with a white pupil. In one instance two pupilled eyes are present, and in two cases three. These were just the first thirty I came across. The females taken are similar to the last, having two or three on hind wing, and one additional towards anal angle of fore wing.

Satyrus priouri.—Only a short series obtained, mostly near Losilla, and rarely in the Guadalaviar district, where they were practically over. I was disappointed with the var. *uhagonis*, only getting one or two, and these were poor specimens.

S. actæa.—Two males at El Puerto, and one other seen. They seem to have just emerged, and appear very small when one is accustomed to *S. cordula*.

Lycæna hylas var. *nivescens*.—At Losilla, fluttered along the middle of the path, a few inches from the ground. Some very good—indeed, quite fresh—but not common. The spots forming the P on under side fore wings are much enlarged compared with Swiss and French *hylas*. I saw no females, nor did I meet with any males of the type.

L. corydon var. *hispana*.—This pale variety was very abundant, large, and fresh. It is considerably larger than the type, and is a very striking form. There is a tendency in the male to the formation of a linear discoidal spot or streak on upper side fore wing. In the females the under side is paler than the type, and the black spots on fore wing are generally very large. In these features the female differs from the type.

Var. *albicans*.—One specimen which has the marginal peacock eyes both on primaries and secondaries clearly mapped out in brownish, and is of a decidedly whiter colour than *hispana*, is in this instance probably an aberration of *hispana*, although I suppose it occurs as a local race further south in Andalusia. It was taken in a hollow beside the road at Losilla, which was a favourite resort of many butterflies.

Var. *corydonius*.—Stray specimens of this fine blue variety were taken at Losilla, and seen in the Guadalaviar valley. The difference between this and the pale var. *hispana* is remarkable, occurring so near together.

L. admetus.—Three or four specimens and two or three of var. *ripartii* from both localities. The *L. damon* occurring along with these do not compare favourably with specimens from Aigle.

Lampides bæticus.—Was not uncommon at Losilla, and occasionally newly emerged. One male measures over 40 mm.

L. telicanus.—Several were taken near and some in the woods at Losilla.

Hesperia proto.—A few were netted, amongst which several were very perfect.

One of the "blues" which occurred rather frequently at Losilla, and which I took for *L. baton* at first, from the large black spots on under side, turned out on examination to be *L. argus* (*ægon*). As they were very worn I only brought away one male and one female. In these the spots underneath, particularly of fore wing, are unusually enlarged (noted also in var. *nivescens* and var. *hispana*) and black, and the specimens are pretty big, the female measuring 33 mm.

In addition to the foregoing, *Gonepteryx cleopatra* was seen, occasionally at first, but, like many other species, became scarce towards the end of the period. *Satyrus briseis* and *alcyone* were very common on the way up to Puerto de la Losilla, especially the former, on the heath just before reaching the farmhouse; and *sttilinus*, *fidia*, and *circe* in the Guadalaviar valley.

Epinephele lycaon, *ida*, *pasiphaë*, and *Cænonympha dorus* were all observed, as well as numerous other more generally distributed species.

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NOTES ON A COLLECTION OF LEPIDOPTERA FROM ADEN AND FROM THE TRANSVAAL.

By Major A. S. BUCKLE, R.F.A.

I HAVE been asked to remodel, for publication in this journal, a list—made out three years ago—of Lepidoptera taken in 1899 at Aden, and in 1900–2 in the Transvaal.

In the course of my wanderings on military duty, nothing has been of greater interest to me, as an amateur in the study of entomology, than the distribution of the same species in localities separated by vast distances and differing widely in climate. It is thought, therefore, that the following preliminary list of those insects found both in Aden and in the Transvaal will be of interest also to others.

Danais chrysippus, *P. cardui*, *Junonia cebrene*, *H. misippus*, *P. bæticus*, *Belenois mesentina*, and *Utetheisa pulchella* are old friends one meets with everywhere in or near the Tropics, at any rate east or south of Suez. *Parnara mathias* I took at Aden, and also at Pretoria. The beautiful "eyed" Noctua, *Cylogramma latona*, is abundant at Aden, and I believe I took it in the Transvaal, but the record is uncertain; I certainly saw it at Mosambique and at Durban.

All the above ubiquitous insects are common or abundant both in Aden and in the Transvaal.

List A includes those taken at Aden.

Nearly all the butterflies mentioned were taken among the

scanty herbage growing-- somehow—in the sand and stones of “Goldmohur Valley,” which is the widest of several dry, stony torrent-beds leading down from the crags of Jabal Shamsham, the great crater-wall, to the sea. No more unpromising spot for Lepidoptera could be imagined than the barren Peninsula of Aden. Practically no herbage exists save in these valleys; there, however, butterflies swarmed. A few were taken in the cultivated ground across the harbour; but inland, even in the fertile district of Lahej, there were very few butterflies to be seen. I only remember seeing *Delias eucharis*, but did not take it.

The few species of moths noted in List A swarmed in to light in the bungalows at “Steamer Point,” about May and June.

List B, those taken in the Transvaal.

In those troublous years 1900–2, there was not, as a rule, much opportunity of collecting insects in the Transvaal! At Pretoria, however, in the hot weather 1900–1, opportunities did occur. Through the kindness of Dr. Gunning and Mr. Zwierstra, of the Pretoria Zoological Gardens, I found myself armed with a net and a killing-bottle; and numerous short forays in the gardens, fields, and thickets of Fountains Grove, one and a half miles to the south, on the stony kopjes surrounding the town, and in the flower-gardens of the officer's quarters at the “Staats Artillerie” Barracks, yielded a fair return.

I again found chances of collecting while stationed at the Dynamite Factory at Modderfontein, twelve miles north of Johannesburg. This locality is 1000 ft. higher than Pretoria, being about 5800 ft. above sea-level, and is in the midst of the “High Veld.” Here butterflies were not so numerous; such as were obtained were usually taken at the flowers of the eucalyptus trees, or amongst the tall grass.

Nearly all my Transvaal moths, however, were taken at Modderfontein; they swarmed in nightly to the electric lights in the factory dwellings.

The only other locality in the Transvaal where I found it possible to make any attempt at collecting was Pietpotgietersrust, in the “Bush Veld,” more than one hundred miles north of Pretoria, and much lower and hotter than that place. Returning from a mission to General Plumer's force, which had just (April, 1901) opened up the Pretoria-Pietersburg Railway, and “moved on” the migratory Boer Government from its temporary seat in the Zoutpansberg, my train had to “cross,” at Pietpotgietersrust, no less than *seven* trains hurrying up with troops and supplies. In the two hours of delay thus enforced, I worked the gardens close to the station. Besides several species already met with at Pretoria and swarming here, in those two hours I took *V. antalus*, *Teracolus omphale*, *ramaguebana*, *pseudetrida*, and *imperator*; none met with elsewhere. *Mylothris agathina*, too,

I took there first; one specimen subsequently at Modderfontein. It may be imagined with what reluctance I left this happy hunting-ground at the end of my two hours! The semi-tropical "Bush Veld" would well repay the collector who had time to explore it; but it was not my good fortune to hunt there again.

Besides those mentioned in List B, I had the good luck to take several undescribed moths (at Modderfontein).

N.B.—In the following lists (a) = abundant, (c) = common, and (r) = rare.

LIST A.—ADEN.

DANAIDÆ.—*Danaïs chrysippus* (a), *alcippoides*, *klugii* (c), *dorippus*.

SATYRIDÆ and ACRÆIDÆ.—Nil.

NYMPHALIDÆ.—*Pyrameis cardui* (c), *Junonia cebrene* (a), *Hypolimnas misippus* (c).

LYCÆNIDÆ.—*Polyommatus baticus*.

PIERIDÆ.—*Terias boisduvaliana*, *Synchlōe glauconome* (a), *Belenois mesentina* (a), *Teracolus calais* (a), *phisadia*, *halimede*, *pleione*.

PAPILIONIDÆ.—Nil.

HESPERIDÆ.—*Parnara mathias*, *Hesperia adenensis* (a).

SPHINGIDÆ, SATURNIADÆ, SYNTOMIDÆ.—Nil.

ARCTIADÆ.—*Utetheisa pulchella* (c).

AGARISTIDÆ.—Nil.

NOCTUIDÆ.—*Cylogramma latona* (a), *Agadesa materna* (a), *Mœnas fullonica*.

(No other families represented.)

LIST B.—PRETORIA, MODDERFONTEIN, AND PIETPOTGIETERSRUST.

DANAIDÆ.—*Danaïs chrysippus* (a).

SATYRIDÆ.—*Pseudonympha vigilans*, *narycia*.

ACRÆIDÆ.—*Acrœa horta* (c), *neobule*, *natalica* (r), *acontias* (r), *rahira*.

NYMPHALIDÆ.—*Atella columbina* (c), *Pyrameis cardui* (c), *Junonia boöpis* (c), *cebrene* (a), *Precis calescens*, *sesamus* (c), *archesia*, *ceryne*, *Catacroptera cloantha* (c), *Hypolimnas misippus* (c), *Byblia ilithyia*, *Hamatumida dædalus* (c).

LYCÆNIDÆ.—*Lachnocema bibulus*, *Uranothauma nubifer*, *Cacyreus marshalli*, *Tarucus sybaris* (c), *Polyommatus baticus*, *Hypolycena philippus*, *Virachola antalus*, *Myrina ficedula*, *Zizera knysna* (c), *lucida*, *Alcides orthrus* (c).

PIERIDÆ.—*Terias brigitta* (a), *Mylothris agathina* (r), *Synchlōe hellica* (c), *Belenois severina*, *mesentina* (a), *Colias hyale*, form *electra* (a), *Teracolus omphale*, *omphaloides*, *eione*, *ramaguebana*, *pseudetrida*, *halimede*, *pleione*, *imperator*, *Catopsilia florella* (c).

PAPILIONIDÆ.—*Papilio demodocus* (a).

HESPERIDÆ.—*Rhapalocampa pisistratus*, *Parnara mathias*, *Parosmodes morantii*, *Platylesches ruba*, *Kedestes mohozutzo*, *Hesperia mafa*, *Eretis djelcælæ*.

SPHINGIDÆ.—*Macroglossa trochiloides* (c), *Ællopos hirundo*, *Basiothea idricus* (c), *Cephonodes hylas* (c), *Chærocampa celerio* (c), *schenki*,

Deilephila opheltes (c), *livornica* (c), *Theretra capensis* (c), *Nephele funebris* (a), *Acherontia atropos*, *Daphnis nerii*.

SATURNIADÆ.—*Nudaurelia tyrreha* (a).

SYNTOMIDÆ.—*Thyretes catta*, *Metarctia rufescens* (c), *buna*, *lateritia* (c).

ARCTIADÆ.—*Dionychopus amasis* (c), *Estigmera linea* (c), *Mœnas arborifera* (c), *Diacrisia lutescens*, *flava*, *Teragotona submacula*, *Carcinopodia argentata*, *Utetheisa pulchella* (c).

AGARISTIDÆ.—*Xanthospilopteryx superba* (c), *Pais decora* (a), *Ægocera fervida* (c).

NOCTUIDÆ.—*Cyligramma latona* (a), *Sphingomorpha monteironis*, *Achæa catella*, *Pandesma guenavadi*, *Metachrotis hypotænia* (c), *accincta*, *varia*, *Euclidia dubitans* (c), *Cosmophila erosa* (c), *Megalodes pienrari*, *Cerocala contraria*, *Matopo typica*, *Tarache dispar* (c), *hyperlophia*, *tropica*, *margaritata*, *liturifera*, *natalis*, *Nuranga admota*, *Chloridea scutuligera*, *obsoleta*, *Euxoa scgetum*, *spinifera*, *epipyria*, *Migragrotis puncticostata*, *strigibasis*, *interstriata*, *Leptodenista xantholopha*, *Spodoptera exempta*, *Perigea capensis*, *Chirippa leucosoma*, *Tathorhynchus vinetalis*, *Agrotis annularis*, *cauta*, *Raghura multi-radiata*, *Leucania promineus*, *ameus*, *tacuna*, *Baniana arborum*, *Acontia malvæ*, *Plusia eriosoma*, *Dugaria glaucinaus*, *Argysotis pallidistria*, *Polydesma collutrix*, *Timora lanceolata* (c), *disticta*.

COSSIDÆ.—*Azygophleps asylas* (c).

NOTODONTIDÆ.—*Rigema aurifodina*, *Anthena simplex*, *Zana spurcata*.

HEPIALIDÆ.—*Gorgopis libanea* (c), *catta*, *bacoti*.

LASIOCAMPIDÆ.—*Odontocheiloptyx* ? *sobria*.

LIMEODIDÆ.—*Tæda detitis*.

LYMANTRIADÆ.—*Euproctis quadripunctata* (c), *nobilis* (c), *Aroa perculata*.

EUPTEROTIDÆ.—*Phiala xanthosoma* (c).

ZYGENIDÆ.—*Crameria dockneri*.

GEOMETRIDÆ.—*Psilaleis crassa* (c), *Conchia nitidula*, *Tephрина deenaria*, *Peridela johnstoni*, *Osteodes turbulentata*, *Nemoria* ? *attenuata*, *Ortholitha monosticta*, *pudicata* (c), *Sterranthia sacraria*, *Idæa remotata*, *spoliata*, *Epirrhoë undulosata*.

PYRALIDÆ.—*Glyphodes indica*, *Leucinodes vagans*, *orbonalis* (c), *Pagya* sp. (c), *Lygropia* ? *nigricorinus*, *Phlychænodes fulvalis*, *venustalis*, *Zinckania fascialis* (a), *Sceliodes laisalis*.

CRAMBIDÆ.—*Ancylolomia* sp., *prepiella*, *locupletella*.

ON THE IDENTITY OF TWO SOUTH AMERICAN LYCÆNIDS.

BY W. J. KAYE, F.E.S.

IN the 'Proceedings of the Zoological Society for 1907' Mr. H. H. Druce has described on pp. 625, 626, and figured on plate xxxvi. figs. 22, 23, a new species of *Thecla*, viz., *Thecla politus*. This is typical *beon*, as figured by Cramer, Pap. Ex. iv.

pl. 319, figs. B, c. The pale blue colour of the hind wings, the blue streak on inner margin of fore wing, and the conspicuous red spot at the anal angle above all show most conclusively that this is the insect as figured by Cramer. Whether Cramer's insect is a constant or variable one is difficult to decide, but that *Thecla politus* = *Papilio beon*, Cram., in its figured form there can be no doubt. The synonyms given under *Thecla beon* in Mr. Druce's paper, p. 609, may or may not be synonyms of *Papilio beon*, Cram.; it would depend on whether *beon* was a constant species or not. Mr. Druce evidently considered his *Thecla politus* (= *Papilio beon*) was constant, and my own opinion coincides with his.

The *Tmolus isobea*, Butl. & Druce, therefore would become another species, and the synonymy of the two insects would read:—

1. *Papilio beon*, Cram., Pap. Ex. iv. pl. 319, figs. B, c.
Thecla politus, Druce, P. Z. S., 1907, pp. 625, 626, pl. xxxvi.
 figs. 22, 23.
2. *Tmolus isobea*, Butl. & Druce, Cist. Ent. i. p. 108.
Thecla bacra, Hew., Ill. Diur. Lep. p. 194, pl. 77, figs. 619, 620.
Thecla caulonia, Hew., *ibid.* p. 188, pl. 75, figs. 587, 588.
Thecla vibulena, Hew., *ibid.* p. 190, pl. 76, figs. 599, 600, 601, 602, 603.
Thecla bellera, Hew., *ibid.* p. 194, pl. 77, fig. 618.

In the same paper, on pp. 626, 627, the identification of *Papilio echion*, Linn., is discussed. Mr. Druce says that Dr. Butler has identified *Tmolus basalides*, Hübn., as *T. echion*, Linn., and, in *litt.*, he says: "As regards *echion*, Linn., I accept the identification again of Hewitson and G. & S., and treat *crolus*, Cram., as a synonym (of *echion*, Linn.). Dr. Butler's *echion*, Linn., I consider *basalides*, Hübn." This is unfortunate. If Mr. Druce had gone to the root of the matter he would have agreed with Dr. Butler, and found that *crolus*, Cram., does not equal *echion*, Linn., but that *basalides*, Hübn., does equal *echion*, Linn.

Linné's description of *echion* in Syst. Nat. 12th ed., p. 788, reads:—"Alis bicaudatis supra fuscis; subtus pallescentibus; fascia rufa ocelloque rubro. Roes. add. t. 7, figs. 3, 4. Alæ posticæ ad basin caudarum macula ocellari rubra."

Even by Linné's description it is obvious that *crolus*, Cram., cannot be the same as *echion*, Linn., as *crolus* has no sign on the upper side of the hind wing of "macula ocellari rubra." But as Linné refers to the figure in Roesel's addendum, there is not the least doubt left that what Dr. Butler identified as *echion*, Linn., is correct, and that *Tmolus basalides*, Hübn., is a synonym thereof, as also is *Thecla ziba*, Hew.

In Roesel's figure the orange transverse band on the under side of the fore wing is shown most distinctly curved, while in *crolus*, Cram., it is straight. The figure shows the band too near the middle of the wing, but even for *crolus*, Cram., it is not correctly placed. The figure does not show the orange spot at the anal angle of hind wing above, but this is not always present in a long series of specimens.

The synonymy thus stands:—

Papilio echion, Linn., Syst. Nat. 12th ed., i. p. 788, n. 224.

Tmolus basalides, Hübn., Zut. Ex. Sch. figs. 977, 978 (1837).

Thecla basalides, Hew., Ill. Diur. Lep. Lyc. p. 156, pl. 61, figs. 412–415.

Thecla basalides, G. & S., B. C.-A. Lep. Rhop. vol. ii. p. 93 (1887).

Thecla ziba, Hew., loc. cit., p. 153, pl. 61, figs. 404, 405.

The *Papilio crolus* of Cramer remains, therefore, a distinct species.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE HEMIPTERA.—No. 7.*

By G. W. KIRKALDY.

I.

ALTHOUGH vol. x. of the 'Encyclopédie Méthodique' is dated 1825, Sherborn has shown that pp. 345–832 were not published till 1828. My entry (Entom. xxxiii. 265, 1900) must therefore be amended by the first citation in 1825 reading p. 1–344, and by removing thither "(α) *Globiceps t. capito*." The rest of the entries in the second division of Lepelletier & Serville's entry should be pp. 345–832 and dated 1828.

II.

A FORGOTTEN NOTE ON IRISH HETEROPTERA.

In the 'Entomologist,' xi. pp. 2–8 (Jan., 1878), J. A. Power furnished "A Contribution to the Entomology of Ireland" with lists of Coleoptera and Hemiptera [Heteroptera]. As the latter, comprising sixty-two species, have been overlooked by Saunders in the "Hemiptera Heteroptera of the British Islands," they are called attention to here.

III.

Hagen (Bibl. Ent. i. 457), in citing Leach's article, "Entomology," in Brewster's 'Edinburgh Encyclopædia' (1815), records

* No. 1. Entom. xxxiii. 238–43 (1900); 2. Entom. xxxvii. 254–8 (1904); 3. Entom. xxxvii. 279–83 (1904); 4. Entom. xxxviii. 76–9 (1905); 5. Entom. xxxviii. 304–8 (1905); 6. Entom. xxxix. 247–9 (1906).

reimpression in 1830, of which there is a copy at the British Museum. It does not, I think, differ from the first edition, that is, as regards the Hemiptera.

I have recently acquired an American edition in eighteen volumes, published at Philadelphia, which is said to be "corrected and improved by the addition of numerous articles relative to the institutions of the American Continent," but I cannot see that the part dealing with "Hemiptera" is altered. As I have not seen it previously referred to, and as it is not apparently in the Library of the United States Department of Agriculture,* it is as well to refer to it now. "Entomology" is discussed in vol. viii. pp. 646-758, and the Hemiptera on pp. 709-715. 1832 is the date of the entire publication.

IV.

In the 'Entomologist' for 1905, p. 307, I published what information I had then in my possession regarding the dates of publication of Burmeister's 'Genera Insectorum.' I now find further information in the 'Zeitschrift für die Entomologie,' i. 298-9 (1839).

Of the parts of the dates of which I was ignorant, it is stated that *Bythoscopus*, *Eurymela*, *Acocephalus*, and *Lystr* (sic!) were published in 1838, fascs. 1 and 2; so that the correct dates are as follows, for Hemiptera:—

Hefts 1 and 2 (1838): *Bythoscopus* (no. 10); *Eurymela* (no. 17); *Acocephalus* (no. 11); *Lystra* (no. 20) [Ed. 2, 1840-6]; probably completing heft 1; *Selenocephalus* (no. 12); *Cœlidia* (no. 15); *Eupelix* (no. 6); *Jassus* (no. 14).

Heft 3 (1838): *Ulopa* (no. 3); *Dorydium* (no. 5); *Cephalelus* (no. 4); *Ledra* (no. 9).

Heft 4 (1838): *Gypona* (no. 16); *Xerophlœa* (no. 8).

Heft 5 (1840): *Paropia* (no. 7).

Heft 6 or 7 (1841): *Typhlocyba* (no. 13).

Heft 8 (1845): *Fulgora* (no. 18) [with subgenus *Pyrops*, no. 19 in Index].

V.

Fam. CICADIDÆ.

(a) Distant (1906, Cat. Hom. i. 180) cites *Tettigonia tibialis*, Panzer, as a species (unseen by him) of *Pauropsalta*. This may be (I have not Panzer's work complete), but *Tettigetia tibialis*, Kolenati, given as a synonym, is certainly not, as the figure clearly shows six apical cells in the wing.

(b) Distant (p. 167) has omitted *Cicadetta prasina* var. cau-

* See "Catalogue of Publications relating to Entomology in the Library of the United States Department of Agriculture," Bull. U.S. Dep. Agr. Libr. 55, pp. 1-562 (1906).

casica (Kolen. *op. cit.* pl. 6, f. 10), also (p. 38) *Cicada plebeja* var. *armeniaca* (Kolen. pl. 5, f. 1).

(c) On p. 124. for "*Cicada stevensi* (sic!), Kryn. Mus. Berol.," read "*Cicada stevenii*, Krynicki, 1837, Bull. Soc. Nat. Moscou, v. 86, pl. vi. f. 1 = *Cicada* (*Tibicina*) *stevensii*, Kolen., 1857, *op. cit.* xxx. 416, pl. vi, f. 7."

(d) On p. 167 *Cicadetta subapicalis* (Walk.) = *adusta*, Hagen.

(e) CHREMISTICA, Stål, 1870, O. V. A. F., xxvii. 714, type "*viridis* (Fabr.), Stål = *bimaculata* (Oliv.) = *Diceroprocta*, Stål, l. c., type *alacris* (Stål) Stål = *transversa* (Walker) = *Rihana*, Distant, 1904, A. M. N. H. (7), xiv. 425, type *ochracea* (Walker), Dist.

Distant (Cat. Hom. pp. 32 and 38) has split the [sub-]genera *Chremistica* and *Diceroprocta*, placing part of each in *Cicada* and *Rihana*. The type of *Diceroprocta*, however, is (sec Distant) a *Rihana*, as also the type of *Chremistica*.* *Rihana* is therefore unnecessary.

(f) PLATYLOMIA, Stål. Distant (p. 58) says that this was not described by Stål, and was only a name in 1870! On the contrary, it was described by Stål (in the place cited by Distant), who doubtfully ascribed *flavida*, Guérin, as the type. As the *flavida* of Guérin is a *Platylomia*, and there is no reason to suppose Stål was not correct in his determination, I cannot see how *flavida* can be set aside as type, to admit *spinosa* (which is invalid in any case, as Stål places it at the head of his subgenus *Cosmopsaltria*.)

Fam. COCCIDÆ.

I have received Sanders' Catalogue of recently described Coccidæ,† which will undoubtedly be of great use. I must, however, take exception to two statements. Regarding p. 2, footnote, I did not (in my Catalogue of the Aphidæ) consider *Polyocellaria* to be an Aphid on my own responsibility; I noted that it was described as probably allied to *Orthezia*, on the authority of the 'Bericht der Entomologie,' but marked the genus with a †, signifying that I had not seen the description. I placed it among the Aphidæ on the authority of the 'Zoological Record,' usually a safe guide.

My *Eulecanium curtisii* is noted as not valid, but I cannot concur. *Coccus aceris*, Curtis, was stillborn, and cannot be resuscitated.

Fam. CIMICIDÆ.

(a) *Lamprophara bifasciata* = *Calliphara* (*Scutellera* ?) *bifasciata*, A. White, 1839, Mag. Nat. Hist., n. s., iii. 541.

* Three species are mentioned in *Chremistica*, the two last being compared to the first, which should therefore be considered the type.

† Bull. U.S. Ent. Techn. Ser., 12, pp. 1-18.

(b) *Coleotichus*, A. White, *l. c.* (misquoted by Lethierry & Severin, and in Schouteden's Monographs).

Fam. CORIXIDÆ.

Corixa contortuplicata, n. n. for *C. irrorata*, Fieber, 1851 (or 1852), not H.-S. 1850.

ON SOME RECENT BIBLIOGRAPHICAL NOTES.

BY W. L. DISTANT.

IN the last issue of the 'Entomologist' (p. 291), Mr. Cockerell writes that the species which I call *Herrera marginella* (Cat. Cicadidæ, p. 121) is based on *Cicada marginella*, Walk, but is not the *Cicada marginella*, Fabr., Syst. Rhyng. p. 96, and proposes that the species should be known by the name of its synonym, *Herrera ancilla*, Stål. It is not often that Mr. Cockerell makes a slip.

1. The species described by Fabricius (Syst. Rhyng. p. 96) is *Cercopis marginella (costalis)*, not *Cicada marginella*. This is a well-known member of the Tettigoniellidæ (Jassidæ).

2. Walker neither supposed nor intended his species to represent that of Fabricius, which he rightly recorded in its proper place (List Hom. Suppl. p. 224 (1858)).

5. Fabricius did describe a *Cicada marginella* (Mant. Ins. ii. p. 271), but not where Mr. Cockerell quotes. This is also a well-known species of Tettigoniellidæ, and recognized and recorded as such (1854) before Walker described his species (1858). The synonymy therefore now stands:—

Herrera marginella.

Cicada marginella, Walk., List Hom. Suppl. p. 21 (1858).

Carineta ancilla, Stål, Stett. Ent. Zeit. xxv. p. 57 (1864).

Carineta marginella, Dist., Biol. Centr.-Amer. Rhynch. Hom. i. p. 21, t. ii. f. 16, a, b (1883).

Herrera marginella, Dist., Ann. Mag. Nat. Hist. (7), xv. p. 486 (1905).

Herrera ancilla, Cockerell, Entom. 1907, p. 291.

It seems a pity that Mr. Kirkaldy does not make himself familiar with his subject before writing as a critic thereon. In his note on the food-plants of some species of Oriental Rhynchota (1907, p. 282) he again breaks forth in strictural comment. He writes *Leptocoris augur* (= *Serinetha*, Dist.). Now, if Mr. Kirkaldy likes to use *Leptocoris* for *Serinetha*, no one objects; he has a right to write as he prefers, and no one is compelled to follow him. But it is inexact to write "*Serinetha*," Dist.; he gives me

too much credit. That name, as I employ it, has been previously used in the same sense by Dallas, Stål, Lethierry and Severin, and Bergroth—the last-named a purist in these matters. But if a name is changed, surely adhesion to the change should be maintained by its advocate. Mr. Kirkaldy recently pointed out, and correctly so, for it was on the authority of Stål, that *Zamila*, Walk. (1862), must be accepted as a synonym of *Pyrilla*, Stål (1859). He now, and in this note, uses the name *Zamila* himself! Some of his other animadversions have been made before and replied to by myself (Ann. Soc. Ent. Belg. li. p. 221), to which he does not refer. I therefore decline to notice them further, and consider such cavilling as outside serious entomology.

NOTES AND OBSERVATIONS.

EARLY STAGES OF AMERICAN BUTTERFLIES WANTED.—I should be greatly obliged if any reader of the 'Entomologist' would give me information which would enable me to obtain the ova or pupæ of North American butterflies, the food-plants of which are common in this country.—E. E. BENTALL; The Towers, Heybridge, Essex, December 10th, 1907.

FOE OF DRAGONFLY-NYMPS.—Mr. A. O. Rowden, writing from Exeter, on December 16th, 1907, says that the water-boatman (*Notonecta glauca*) attacks the nymphs of dragonflies.—W. J. LUCAS; Kingston-on-Thames.

PREVENTION OF MOULD IN INSECTS.—Mr. Plum's suggestion (Entom. xl. 290) as to the prevention of mould in relaxing-boxes may possibly prove useful in some cases; but nothing could well be better than the plan proposed some years ago by my friend Mr. Woodforde, of Market Drayton, viz. a few drops of dilute carbolic acid mixed with the water used to damp the cork (or sand, if used). I have a box at the present time containing several specimens of *M. tristata*, which I took in Argyllshire early in July. The box has been frequently used since, and the cork repeatedly damped, but not a vestige of mould is perceptible on the specimens of *tristata*, and if they were worth it, I daresay I could set them to-morrow.—(Rev.) CHAS. F. THORNEWILL.

FOOD OF THE LARVA OF *ACIDALIA OCHRATA*.—With reference to Mr. Conquest's remarks as to the food of *A. ochrata* (Entom. xl. 296), I had some young larvæ years ago, which fed freely on the flowers of a hawkweed, and I think that they might possibly be reared on dandelion. My experience with *A. strigilata* corresponds very closely with Mr. Conquest's.—(Rev.) CHAS. F. THORNEWILL; Calverhall Vicarage, Whitechurch, Salop, December 6th, 1907.

ICHNEUMON FLY OPENING COCOON OF *BRYOPHILA MURALIS*.—Idling away a sunny morning, July 22nd, 1907, at Winscombe, in Somerset,

I happened to be standing near an old wall inhabited by numbers of the Hymenoptera, *Osmia rufa* and *O. cærulescens*, and by the Lepidoptera, *Bryophila muralis* and *B. perla*, when I noticed an ichneumon fly alight on the wall and begin examining it. In a minute or two another of the species also settled, and the first flew away. The second one, after running about with antennæ held down and vibrating, stopped near a cocoon of *B. muralis*. It bent its antennæ on to the cocoon, appearing to press them down with some force, and at the same time vibrating them much more violently than before. After doing this for a short time it walked away, but quickly returned and repeated the performance from the other side. Next, it opened a small hole in the cocoon with its jaws, and pushed its head in. Apparently finding nothing, it withdrew and flew to another part of the wall. I then opened the cocoon, and found that it was of the usual double type, namely, a thin layer of particles of earth fastened together with silk, making a crack between two stones flush with the rest of the wall, and about an eighth of an inch deeper and quite separate, the true cocoon similarly constructed, which in this case contained a living pupa of *B. muralis*. The ichneumon soon found another cocoon of *muralis*, and did exactly as before, except that it pushed its head and thorax completely inside. This cocoon was an empty one. It then flew off, and fearing to lose it, I captured it. Mr. Claude Morley has identified it as a female of *Calichneumon consimilis* (Wesm.), and in his 'Ichneumonologia Britannica,' vol. i., p. 31, states that Mr. Stanley Kemp has bred several of both sexes together from chrysalids of *Bryophila muralis* (Forst.) [= *glandifera*, Hb.] at Hythe, in Kent, during September, 1901. He tells me it had not been bred before, and has only been recorded in Britain from Kent, Norfolk, Herts, and Devon, and says he has never heard of the parasite tearing open a lepidopterous cocoon, and that such a thing is unrecorded in ichneumonological annals.—E. A. COCKAYNE; 16, Cambridge Square, W.

THE BARRETT COLLECTION.—The extensive collection of "Micro-Lepidoptera" amassed by the late Mr. C. G. Barrett was broken up at Stevens's Auction Rooms on December 3rd last. From a rough casting of the figures, we find that the Tortricina (nearly 10,000 specimens) realized about £30, and the Tineina (over 14,000 specimens) something like £37. The collection was offered in 121 lots, and in all but 10 of these there were over 100 examples. 47 of the lots contained from 200 to 300 specimens; and in 11 others there were over 300, the number in one lot reaching 431. The total realized gives an average of somewhere about 5/6 per 100. In some few cases the bidding per lot fell under 2/- per 100, but in others it ranged from 8/- up to 15/- per 100. Space will not permit of much detail, but it may be mentioned that 10 specimens of *Brachytenia woodiana*, offered in sets of 5, realized 59/-. A lot of *Sciaphila*, comprising all the British species, and numbering 352 specimens, made 32/6. Lot 52, comprising 226 specimens of *Eupacilia*, including *curvistrigana* (14) and *manniana* (5), sold for 37/6. Sixteen *Argyrolepis schreibersiana* and twelve *Lozopera beatricella*, with 133 other things, brought in 28/-. For a lot comprising *Bankesia conspurcatella* (two

males, two females, and two cases), *Solenobia lichenella* (nine females and cases), *S. inconspicuell*a (nine males, five females), *S. wockii* (three), *Teichobia verhuell*ella (thirty-four), and *Diplodoma margin*epunctella (eleven, and two cases), 35/- were obtained.

THE W. J. CROSS COLLECTION.—This was also sold on December 3rd. Among the more important items were an aberration of *Argynnis selene*, with pale yellow ground colour, 115/-, a cream-coloured example of *Cænonympha pamphilus*, 22/-. Three lots of *Nyssia lapponaria*, each containing one male and three females, sold for 12/-, 8/-, and 8/-; one male and two females of the same species made 7/-. Two examples of *Lygris reticulata* brought in 15/-. Sixty-five specimens of *Eupithecia*, including four examples of *stevensata*, made 10/-. Nine specimens of *Polyphloc*a ridens, one a fine banded form, and other things, went for 45/-. Two lots of *Xylomyges consp*icillaris (type 1, var. *melaleuca* 2) sold for 22/- and 23/-; two other lots of the same species (type 2, var. 1) fetched the same prices per lot. One specimen of *Hydrilla palustris* (Wicken, 1906), with 18 *Phothedes captiuncula* and other species, sold for 21/-. Six specimens of *Xylina conformis* (Evan John) made rather over 10/- each, and two examples of *Cucullia gnaphalii* (Sheldon, bred 1901) brought in a guinea. Of Tortricina there were 2572 specimens, put up in 16 lots; these sold for 56/-, or about 2/- per 100.

RAYNOR COLLECTION.—In our report of this sale (November 5th) we omitted to mention var. *varleyata*, a specimen of which sold for £4 10s. This should have been included among the highest prices given for varieties of *Abraxas grossulariata* instead of var. *chalc*ozona.

CAPTURES AND FIELD REPORTS.

LEUCANIA VITELLINA IN WEST CORNWALL.—In the 'Entomologist,' vol. xxxix. p. 290, I recorded the capture in 1906 of a fine specimen of this species in West Cornwall, asking if it was not a record for the county. Mr. W. Daws replied in vol. xl. p. 40, that it was the first recorded capture, but that he had taken one in 1899, and had others in his possession taken west of Penzance, although no dates were given. I have to record having captured two other specimens this season.—W. A. ROLLASON; Lamorna, Truro, December 2nd, 1907.

CARADRINA AMBIGUA IN WEST CORNWALL.—I have this year taken wild about half-a-dozen beautiful specimens of this species, and from one of the same obtained ova which duly hatched, and are now slowly feeding through the winter. This is, I believe, the first recorded capture for the county, and seeing that the species is now regularly taken, though not commonly, in Devonshire, I think we may assume that it can no longer be considered "perhaps an occasional immigrant only," as suggested by Meyrick, but a permanent resident.—W. A. ROLLASON.

CLEORA GLABRARIA IN WEST CORNWALL.—In the 'Entomologist,'

vol. xxxviii. p. 94, I recorded what Mr. South believed to be the first capture of this species for the county. I have to record the capture of a second specimen this season, and from another locality.—W. A. ROLLASON.

LEPIDOPTERA CAPTURED IN THE KINGSTON DISTRICT, SURREY, 1907.—On August 3rd last I took one example of *Hydrelia uncula* by the side of the Penn Ponds, Richmond Park. Of *Phibalapteryx fluviata* I obtained a male specimen in June, and a specimen of *Harpipteryx scabrella* was found on a garden fence on September 1st. A fine example of *Calligenia miniata* was boxed in a tramcar at Kingston Hill.—PERCY RICHARDS; Wellesley, Queen's Road, Kingston Hill.

CAPTURES AT ELECTRIC LIGHT.—In conjunction with men employed by the Chester Corporation Electric Lighting Company I am able to record the following captures during October and November of this year (1907):—*Brachionycta sphinx*, male (2); *Dasypolia templi*, male and female (2); *Hybernia defoliaria*, male (3); *Calocampa exoleta* (2); dark form of *Ennomos tiliaria*, male (1); *Lithosia complana* (1); also a considerable number of other commoner species. My object in recording the above is to suggest to others interested the adoption of a similar method, and I am confident, if the prevailing weather is suitable, that the labour involved will not be in vain. I may say, in addition, that all the specimens above-named are in good condition.—ALFRED NEWSTEAD (Curator), Grosvenor Museum, Chester, December 5th, 1907.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—November 20th, 1907.—Mr. G. H. Verrall, Vice-President, in the chair.—Mr. Leonard Woods Newman, of Bexley, Kent, and Dr. Ivar Trärårdh, of Upsala University, Sweden, were elected Fellows of the Society.—Mr. H. St. J. Donisthorpe showed, for Mr. West, examples of *Tropideres sepicola*, F., New Forest, July, 1904; *Oxylæmus variolosus*, Dufs., Darent Wood, March 1903; and *Apion annulipes*, Wenck, Darent Wood, 1905.—Mr. H. J. Turner exhibited cases to illustrate the life-history of *Coleophora onosmella* and of *C. bicolorella*, with photomicrographs by Mr. F. N. Clark, admirably showing the surface of the ova and the structure of the micropylar area.—Dr. F. A. Dixey exhibited several species of five African genera of Pierine butterflies for the purpose of showing the strong mimetic parallelism that existed between them.—Mr. Willoughby Gardner exhibited a remarkably small specimen of *Meloë proscarabæus*, with an example of the normal size.—Mr. W. G. Sheldon showed a case containing many examples of *Araschnia levana* var. *prorsa* and intermediates, bred from larvæ found in the Department of Aisne, France, in June last. Out of 176 individuals that emerged from the pupa, 109 were var. *prorsa*;

four approached nearly to *ab. porima*; the rest were intermediate between *prorsa* and *porima*.—Dr. T. A. Chapman also exhibited specimens of *Araschnia levana*, type, bred 1907, to give a fuller view of this form in assistance to Mr. Sheldon's report.—Mr. G. J. Arrow exhibited a specimen of a handsome exotic cockroach (*Dorylaea rhombifolia*) found alive in the Natural History Museum, an apterous species inhabiting China, India, Madagascar, South Africa, &c., and recorded from Tropical America.—Dr. G. B. Longstaff exhibited a case containing thirty-five Ithomiine butterflies of eleven species, belonging to six genera, taken on March 20th, 1907, near Carácas, Venezuela, some 3600 ft. above sea-level. They afforded a striking exception to Darwin's principle that closely allied forms are not usually found together.—Lieut.-Colonel N. Manders exhibited a collection of some two hundred specimens of tropical butterflies belonging to the genera *Melanitis*, *Mycalopsis*, *Attella*, *Papilio*, and *Catopsilia*, which had been subjected to abnormal degrees of temperature mostly in the pupal stage. The object of the experiments was to ascertain the effect of climate on the colours of tropical butterflies.—Mr. W. J. Kaye exhibited a convergent group of Heliconine butterflies, from the Potaro River, British Guiana; he said that hitherto there had not been detected any species of Danaine or Ithomiine butterfly that might serve as a model or mimic of these species, and if at any time the large *Melinaea mneme*, or *Heliconius numata* group, exerted any influence on these red and yellow and black species, it was unlikely that it did so now, because they had not the same flower-frequenting habit, and were not found in company with them. In illustration of his paper, "Mimicry in North-American Butterflies of the genus *Limnitis* (*Basilarchia*)," Professor E. B. Poulton, F.R.S., showed specimens of *Adelpha* (*Heterochroa*) *bredowi*, ranging from Guatemala to Arizona, and its northern form, named *californica* by A. G. Butler, from California and Oregon. The mutual resemblances appeared to offer a notable example of Dr. F. A. Dixey's principle of reciprocal mimicry.—Mr. H. St. J. Donisthorpe read a paper "On the Life-history of *Lomecosus strumosa*, F."

December 4th.—Mr. C. O. Waterhouse, President, in the chair.—Mr. Walter Feather, of 10, Station Grove, Cross Hills, Keighley, Yorkshire, and the British Somaliland Fibre and Development Company, Berbera, Somaliland, British East Africa; and Mr. Rupert Wellstood Jack, Assistant Entomologist in the Department of Agriculture of the Cape of Good Hope, Cape Town, South Africa, were elected Fellows of the Society.—Dr. G. C. Hodgson, introduced by Dr. T. A. Chapman, exhibited a number of examples of *Anthrocera trifolii*, collected on the same ground in Sussex, and showing a wide range of variation, including three fine melanic forms, and several showing six spots on the upper wings.—Mr. W. J. Kaye showed a specimen of *Papilio thoas thoas*, with the central portions of both tails removed apparently by a narrow-billed bird. The injury appeared so symmetrical that it was thought likely that the specimen was an abnormality. But a careful microscopic examination showed this not to be the case. With it were several species of butterflies from British Guiana, with injuries to the wings in the region of the abdomen, such injuries to Danaine

butterflies being quite rare.—The President showed two photographs of an African locust, which had apparently caught a mouse and was preying upon it. The specimen was found in the Congo State.—Mr. R. S. Bagnall exhibited and read notes on many rare species of Coleoptera, Thysanoptera, and Aptera, from Northumberland, Durham, and Scotland, of which ten were new to Britain.—Mr. W. L. Newman exhibited a long and varied series of *Ennomos autumnaria* (*alniaria*); a series of *Polia xanthomista* (*nigrocincta*) bred from ova and fed on carrot, the specimens unusually large (North Cornwall); three pairs of hybrid *Notodonta ziczac* male \times *dromedarius* female = *newmani* Tutt; three fine *Xylina conformis* bred by Evan John, South Wales; three cocoons, *in situ*, of *Dicranura bicuspis* collected wild in Tilgate Forest; and a fine melanic male *Oporabia dilutata* from Bexley Woods—the first melanic specimen of the species reported from Kent.—Dr. F. A. Dixey exhibited male and female specimens of a new *Belenois* allied to *B. zochalia*, Boisd., but quite distinct from the *zochalia* group. These were captured by Mr. Wiggins in the Tiriki Hills, north-east of the Victoria Nyanza.—Professor E. B. Poulton, F.R.S., made a communication on the natural enemies of *Bombyx rubi* in Scotland, and read a note in further illustration of his remarks at the last meeting on the convergence of *Limenitis* (*Basilarchia*) in America.—Mr. J. C. Moulton read a note on “The Rest Attitude of *Hyria auroraria*.”—Mr. A. H. Swinton communicated a paper on “The Family Tree of Moths and Butterflies, traced in their Organs of Sense.”—Mr. E. Meyrick, B.A., F.R.S., F.Z.S., communicated a paper on “Notes and Descriptions of *Pterophoridae* and *Orneodidae*.”—Mr. R. Shelford, M.A., C.M.Z.S., F.L.S., read a paper entitled “Studies on the *Blattidae*.”—The Rev. K. St. A. Rogers, introduced by Professor E. B. Poulton, F.R.S., read a paper entitled “Notes on the Bionomics of British East African Butterflies,” and exhibited many examples collected by him and from the Hope Museum, Oxford, to illustrate his remarks.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 14th, 1907.—Mr. R. Adkin, President, in the chair.—Mr. Hugh Main exhibited imagines of *Charaxes jasius* bred from ova sent him from the Continent.—Mr. Newman, series of (1) *Plusia bractea* captured in Aberdeenshire; (2) *P. chryson* (*orichalcea*) bred from Cambridgeshire larvæ.—Dr. Hodgson, a series of varied *Spilodes palealis* from Dover; specimens of *Plebeius argus* (*cægon*) destitute of orange markings on the upper sides; several aberrations of *Agriades corydon*, including ab. *semisyngrapha* and instances with no orange markings; *A. bellargus* forms without orange on the hind wings; and a series of *Urbicula comma* from Clandon, including pale and dark forms and a beautiful cream-coloured aberration.—Mr. H. Moore, a specimen of *Xylocopa violacea*, captured alive in the London Docks.—Mr. R. Adkin, for Mr. C. E. Young, a *Sirex juvencus* found at Rotherham.—Dr. Chapman, specimens of *Oreopsyche pyrenælla* bred from cases collected at Gavarnie, July, 1907.—Mr. R. Adkin read a paper, “Notes on *Porthesia chrysorrhæa*,” and exhibited a selection of those bred by him from Eastbourne.

November 28th.—The President in the chair.—The Annual Exhibition of Varieties.—Mr. Austin, of Highbury, was elected a member.—Mr. E. C. Goulton exhibited a very varied bred series of *Hypsipetes sordidata* from Surrey localities, and two male *Cosmotriche potatoria* of the pale female colour, captured at Wicken.—Messrs. Harrison and Main, (1) series of *Odontopera bidentata* bred from black Yorkshire parents, from dark Yorkshire parents, and from a very light Wisley female, with numerous collected specimens from many localities, and compared the variations shown; (2) four broods of *Pieris napi* bred from females from the Klein Scheidegg Pass, Switzerland, and remarked on the var. *bryoniae* forms obtained.—Mr. Tonge, (1) a bred series of *Grapta c-album*, from ova laid by a female taken by Mr. Barraud in the Wye Valley, and gave notes on the variation produced, including var. *hutchinsoni*; (2) a series of *Dipterygia scabriuscula*, taken in his garden at Reigate; and (3) a series of very good stereographs of entomological subjects by himself.—Dr. Hodgson, a series of *Anthrocera trifolii* from Sussex (one locality), including var. *hippocrepidis* and ab. *obscura*?, typical of the results of four days' collecting by Mr. Grosvenor and himself, and gave notes on the selective processes used and the results of their observations.—Mr. Scollick, varieties of *Abraxas sylvata*, including a broad dark-banded form, a smoky form almost devoid of markings, forms approaching var. *pantaria*, and one with an entire absence of ochreous—all from Bucks.—Mr. Newman, (1) a fine melanic *Oporabia dilutata* from Kent; (2) long series of *Melitæa artemis* from various English and Irish localities; (3) very varied series of *Notodonta chaonia* from Irish and Scotch localities; (4) hand-paintings of sundry forms bred by him during the season; and (5) three wild cocoons of *Cerura bicuspis* from Tilgate Forest.—Mr. Grosvenor, picked series of *Polyommatus icarus* from various localities, chiefly North Downs, and gave notes on the aberrations.—Mr. W. J. Lucas showed the following varieties of dragonflies from the New Forest: *Pyrhosoma nymphula* var. *æneatum* female, *P. tenellum* var. *æneatum* female, and *P. tenellum* var. *ruberatum*.—Mr. Turner, the life-histories of *Coleophora onosmella* and *C. bicolorella* from Surrey and Kent localities.—Mr. Pratt, a short series of *Mellinia ocellaris* captured in Surrey on sugared leaves of black poplar.—Mr. Edelsten, specimens of *Egeria andreniformis*, bred from collected pupæ, with the ichneumon *Meniscus bilineatus*.—Messrs. F. and H. Champion, (1) the rare grasshopper, *Chelidoptera roeselii*, from Herne Bay; and (2) the dragonflies *Sympetrum sanguineum* from Epping Forest, September 15th, *S. scoticum* from Esher, September 3rd and 20th, the last small, and the female of *Cordulia aenea* from Epping Forest.—Mr. J. Alderson, (1) short series of *Melitæa aurinia*, bred from Cumberland, much undersized and darker than usual; and (2) *Melampias epiphron*, three second-brood specimens bred from ova laid by a Honister female; the remainder of the brood hybernated.—Mr. Garrett, *Argynnis adippe* from Arundel, and *Anticlea sinuata* from the same place.—Mr. Andrews, varieties of Diptera, (1) *Cyrtoneura stabulans* with an extra cell in each wing; and (2) specimens of *Syrphus* and *Platychirus* lacking the usual yellow abdominal markings.—Mr. South, for Mr. Pope of Exeter, (1)

male *Epinephele ianira* measuring only 38 mm.: (2) a pale ochreous brown female of the same species; (3) a male with a symmetrical pale ochreous blotch on each wing and with white fringes; and (4) a *Eubolia plumbaria* with dark purplish slate-coloured fore wings with ochreous edged transverse lines; and, for Mr. Haynes, an aberrant example of *E. tithonus* with the usual fulvous markings, but with the marginal areas whitish instead of dark brown. The last was from Salisbury, the first four from Devonshire. — Mr. Edwards, *Urania leilus*, with a coloured plate, showing the life-history of this gorgeous Jamaican moth.—Mr. F. Noad Clark, with the microscope, ova of several species of *Coleophora* and preparations of the ova to show the structure of the micropylar area.—Dr. Chapman, Lepidoptera collected in the Pyrenees, including *Lycæna orbitulus* var. *oberthuri*, *Erebia lappona* var. *sthennyo*, *E. lefebvrei*, *E. gorge*, *E. stygne*, *E. œme*, *E. cecilia*, *E. tyndarus* var. *dromus*, *Oreopsyche pyrenæella*, and *Marasmarcha tuttodactyla*.—Mr. R. Adkin, (1) specimens of *Tortrix pronubana*, bred from spring larvæ; (2) *Melanippe fluctuata*, with the transverse band reduced to a mere speck; (3) *Agriades corydon*, females from Eastbourne, with more or less well-defined blue scaling; (4) a dark-suffused *Boarmia roboraria*; and (5) forms of *Abraax grossulariata* with yellow-shaded ground.—Mr. Schoon, *Aporia cratægi*, *Tapinostola bondii*, *Bryophila glandifera*, and *Sesia chrysidiformis*, from East Kent. — Mr. Willsdon, numerous species of Lepidoptera, including gynandromorphous *Crocallis elinguaris* from Manor Park, *Heliothis peltigera*, dark and light *Catocala sponsa*, and *C. promissa*, &c.—HY. J. TURNER, *Hon. Report. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — *November 5th.* — Dr. T. A. Chapman exhibited a living male *Cleogene peletieraria* bred from ova laid in August, a species occurring only in the Pyrenees and the Cantabrian Mountains. Dr. Chapman pointed out that the unexpected throwing of a second brood by a single-brooded Alpine species had been paralleled in *Erebia cassiope*.—Mr. J. A. Clark, *Peronea cristana* vars. *ruficostana* and *albicostana*.—Mr. H. M. Edleston, *Abraax grossulariata* ex Raynor collection, with fasciated hind wings.—Mr. W. Bloomfield, various Lepidoptera taken at Finchley during 1907, including *Bombycia ocularis*.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

The Moths of the British Isles. By R. SOUTH, F.E.S., &c. (Series I.—Wayside and Woodland Series.) Pp. 343, pl. 159 (96 coloured, with 671 figures). London and New York: F. Warne & Co. 1907. 7s. 6d. net.

THIS book is uniform with 'The Butterflies,' noticed in 'Entomologist,' 1906, p. 166, and is even more marvellous in so far that for an increase of one quarter in cost it gives half as many more coloured plates, and more than a corresponding increase in text. It

includes the Sphingidæ, Arctiadæ, Lymantriadæ, Nolidæ, Chlœophoridæ, Notodontidæ, Lasiocampidæ, Cymatophoridæ, Saturnidæ, Endromidæ, Drepanulidæ, and a large part of the Noctuidæ.

The coloured figures are by three-colour process, the majority from the insects themselves; with some inequalities these are all of a very satisfactory character, so that the tyro ought to have no difficulty in naming his captures. They are certainly more true to nature than most of the plates in "Barrett," costing about ten times the price, and though the specimens are not so perfect or so well set as Mr. Horace Knight shows them in the fifteen plates from his drawings, nor so pleasing to an artist, they are equally good as illustrations of the species; everyone knows the excellence of Mr. Knight's drawings.

The "Butterflies" gave us an outline of the earlier stages in nearly every instance; this is carried out here only with the earlier families, Sphingidæ, Notodontidæ, &c., only a few species being selected for illustration in the Noctuæ, &c. On the whole, these black-and-white illustrations are good, but some eggs (as Arctiads, with too flat a base) are open to criticism, and the larva of *A. caxa* (which even Buckler refrained from attempting) is no better than some other figures of it we have seen. Where nearly all are excellent, it is perhaps merely personal taste that suggests pl. 33 (with *cucullina* and *carmelita*) or pl. 36 (*batis*, *ocularis*, &c.) as especially pleasing and good.

The book cannot but be useful to any lepidopterist, but is especially addressed to nature lovers in general; for either, we think, it would have been better to have given the Latin names on the plates, and to have added the reference to the page where it is described, this being often at some distance from the plate, introducing a difficulty that did not arise in the "Butterflies," where only sixty-eight species were treated of, whilst here are three hundred and thirty-five. As to the Latin names, it is extremely desirable these should come first, since their scientific character has a quality that must appeal to the most British neophyte, *viz.* it affords a key to immense stores of recorded facts, any one of which he may wish to ascertain. We much doubt the general prevalence of a preference for English over Latin names, and whether there exists one individual who knows the English names in this volume for fifty who know the Latin ones. Unfortunately the book is so excellent and so cheap that this state of affairs may be altered, and unquestionably to the discomfort of those who continue the study and find they have to learn the Latin names also. On p. 158 Mr. South tells us that *D. russula* has now to be called *sanio*, a fact he regrets. Though we are sure it is unfounded, a suspicion arises that, in exhibiting an occasional weakness of the Latin names, he desires to recommend the name under which he describes the species, "the Clouded Buff."

We can find no other than very trivial points that are open to criticism, unless we may include some dissatisfaction that, for our individual benefit, so trustworthy and, within its limits, so complete a work, with such excellent figures and so small a price, did not appear some forty years ago.



Photo by Carson & Co

MARTIN JACOBY. F.E.S.

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MARTIN JACOBY, F.E.S.

WITH the greatest regret we have to record the death of our valued colleague Martin Jacoby, who passed away on December 24th, 1907. When the late Mr. John Henry Leech acquired the 'Entomologist' in 1889, Mr. Jacoby was one of the six specialists who promised their support and consented to act on the Reference Committee of this Journal. Since that time papers on new species of Phytophaga described by him from many parts of the globe have appeared in almost every volume of the publication. Among quite his latest work on this group of the Coleoptera are the descriptions of novelties in the present number, the proof of which he had read and marked for press a few days only before he died.

Mr. Jacoby was born on April 12th, 1842, in Altona, near Hamburg. His boyhood was spent amid poor surroundings in the vicinity of the port of Hamburg. Later on he entered the office of a leather merchant, but the occupation and associations were not in the least adapted to his temperament. In those early days, even as they continued to the end, a love of music and a yearning for the study of Natural History were dominant notes in his life. Advantage was taken of every opportunity that occurred of setting out on a collecting foray, or of attending wherever military or other bands might be heard. Having studied the violin for a number of years he, when about twenty years of age, relinquished the leather business and came to England, when he became a member of Sir Charles Hallé's orchestra then in Manchester. Subsequently he came to London, and joined the orchestra of the Royal Italian Opera. Whilst holding this position he formed a connection as a teacher of his favourite instrument, the violin, and he decided to make London his home.

Before leaving Germany he had commenced to form a collection of birds and insects, but on the advice of the late Edward Hargitt, an authority on woodpeckers, to confine his attention to

some particular group or family of insects, he decided that he would study only the phytophagous beetles. Thus it was that he formed an extensive collection of, and became the acknowledged authority on, this group of the Coleoptera. It would be difficult to estimate, even approximately, the large number of species, procured from all parts of the world, that he has made known to science.

Besides numerous papers published in the 'Proceedings of the Zoological Society,' 'Transactions of the Entomological Society of London,' and in the organs of various learned societies abroad, he was the author of two volumes on Phytophaga in 'Biologia Centrali Americana,' and had just completed a volume on the same group of insects for the 'Fauna of India.' The latter work he had seen through the press, but unhappily was fated not to see it published.

Ever willing and eager to assist in the identification of those insects he understood so well, and of which he had such expert knowledge, he had determined, and where needful described, the phytophagous material in the principal museums and private collections of the world.

Mr. Jacoby was elected a Fellow of the Entomological Society of London in 1886, and he was also a member of several Zoological and Entomological Societies on the Continent. For many years past he was a welcome guest of the Entomological Club, at the annual supper given by Mr. Verrall, and on these occasions he contributed greatly to the pleasure of the evening by his beautiful violin solos. His many amiable qualities endeared him to those with whom he came in contact, in the scientific as well as in musical spheres, and his departure will be deeply regretted by many who have lost a good friend. He leaves a widow, two daughters, and a son.

DESCRIPTIONS OF TWO NEW GENERA AND SPECIES OF AUSTRALIAN EUMOLPINI (COLEOPTERA PHY- TOPHAGA).

BY MARTIN JACOBY, F.E.S.

AGETINELLA, gen. nov. (Eumolpini).

Shape oblong; head perpendicular, forming a plain surface without depressions, clypeus not separated from the face, eyes oblong, entire; antennæ short, the basal two joints thickened, the second one-half shorter than the first, third to sixth joint thinner, equal, the others thicker and more elongate. Thorax transverse, short, sides feebly rounded, posterior margin concave at the sides, median lobe rather pointed, the angles obtuse. Scutellum broader than long, small. Elytra narrowly oblong, lateral lobes absent, surface punctate-

striate. Legs rather short and stout, femora unarmed, tibiæ widened posteriorly, entire, first joint of posterior tarsi about as long as the following two together; claws feebly appendiculate. First abdominal segment as long, or nearly so, as the other segments together. Prosternum very narrowly elongate, mesosternum oblong, slightly broader. Anterior margin of thoracic episternum concave.

This genus, proposed for another very minute Eumolpid, presents another of those transitional forms so frequently found in the Australian Continent, and almost impossible to place satisfactorily in or near any other group. The structure of the head and the long abdominal first segment are almost unique amongst the Eumolpini, where the species is, moreover, one of the smallest of this subfamily.

Agetinella minuta, sp. nov.

Fuscous, with pale elytral apex, or elytra entirely pale. Head and thorax nearly black, antennæ and legs fulvous.

Head minutely granulate and impunctate; antennæ scarcely extending to base of thorax, fulvous. Thorax nearly three times broader than long, sculptured like the head, opaque, with some extremely minute punctures at sides and base. Elytra not wider at base than the thorax, finely and closely punctate-striate, the interstices narrowly longitudinally costate and shining. Body beneath nearly black; legs fulvous, as well as apex of last abdominal segment. Length, $1\frac{1}{2}$ mm.

Hab. Swan River (Lea).

Of the two specimens kindly sent by Mr. Lea, one has the elytra testaceous, the other dark fuscous, with the apex gradually getting paler.

PLATYCOLASPIS, gen. nov. (Eumolpini).

Body elongate, glabrous; eyes entire; antennæ short, first and second joints thickened, the following three joints thinner and longer, the rest subtriangularly thickened, very short. Thorax nearly twice as broad as long, with narrow flattened lateral margins, these subangulately produced at the middle, the surface with a transverse median sulcus; scutellum narrowly oblong. Elytra not wider at the base than the thorax, the sides very strongly deflexed, surface irregularly punctured. Legs slender and elongate, femora unarmed, tibiæ not emarginate at apex, tarsi short, nearly equal, subtriangular; claws appendiculate. Prosternum and mesosternum very narrow and elongate; the anterior margin of the thoracic episternum slightly concave.

This genus is proposed for the reception of a very small species, which would enter the Eumolpid group of Colaspini of Chapuis's arrangement; from any of the genera placed in that group the Australian genus is at once distinguished by the short, submoniliform antennæ, and the extremely narrow prosternum and mesosternum.

Platycolaspis australis, sp. n.

Pale testaceous; head obscure fulvous; the apical joints of the antennæ and the tarsi more or less fuscous; thorax opaque, finely granulose-punctate; elytra strongly and very closely punctured, interstices finely, transversely wrinkled, the sides with a narrow longitudinal ridge. Length, 2 mm.

Head very finely rugose, dark fulvous, opaque, sometimes with a central dark spot or stripe; maxillary palpi slender, apical joint pointed; antennæ extending beyond the base of the elytra in the male, shorter in the female, lower five or six joints pale, rest fuscous. Thorax short and transverse, the surface finely granulate or rugose, opaque, distinctly sulcate at the sides, interior of the sulcus often darkened. Elytra more shining than the thorax, very closely and strongly punctured, the punctures more regularly arranged in rows from the middle downwards, the interstices anteriorly transversely wrinkled; a more or less distinct narrow ridge runs downwards from the shoulders to near the apex. Legs rather darker; metasternum often stained with piceous, shining and impunctate.

Hab. Hobart, Tasmania (Lea).

AN ENTOMOLOGICAL VISIT TO NORTH QUEENSLAND AND TO NATAL.

BY HUBERT W. SIMMONDS, F.E.S.

I LEFT Wellington on Christmas Day, 1906, by the turbine steamer 'Maheno' for Sydney, where I caught the Howard Smith boat (steamship 'Bombala') for Townsville. Brisbane was reached on the 30th, where we had a couple of days. I spent some time in the Botanical Gardens, where I found the beautiful larvæ of *Euplæa corinna*. This larva is very conspicuous, having three pairs of long black protuberances on the first three segments, and also another pair on the next to the last segment. The pupa of this insect is one of the most lovely objects I have ever seen; the first day it is all pale green, but it quickly changes into a delicate mother-of-pearl, striped with three rows of burnished gold on each side, and also having five small brown dots on either side. Other butterflies noticed here were, *Papilio sarpedon*, *Charaxes sempronius*, *Hypolimnas bolina*, *Acræa andromache*, *Danix taygetus*, and a species of *Delias* which I did not get close to; also *Neptis shepherdii* and worn *Papilio ægeus*.

From Brisbane we had a pleasant run north to Townsville, passing several schools of porpoises, and threading our way through the beautiful green islands which line the coast inside the great Barrier Reef. Townsville was reached on January 4th, 1907. Here it was very hot and dry, and my results during the

few hours I was there were very disappointing. Several species of *Catopsilia* were very abundant, but most difficult to catch. *Eurycus cressida* was fairly numerous, as also was *Hypolimnys missippus*, the males far exceeding the females. The females seemed much slower in their flight, and had a habit of settling in the long grass, which made them easier to catch when found, but more difficult to discover unless trodden up. *Acraea andromacha* and *Danaus petilia* were fairly common, whilst I noticed single examples of *Hypolimnys bolina* and *Junonia albicincta*.

At Townsville I transhipped into the little coastal steamer 'Lass o' Gowie' for Cairns. She was very small and slow, and had very little shelter from the sun and rain, whilst she carried far more passengers than she had cabin accommodation for. As a result most of us had to sleep on deck. It was a night I shall not easily forget—men, women and children, Chinamen and whites, all huddled up together, whilst forward were crowds of cane-cutters, black, white, and yellow; and when towards midnight a tropical deluge descended our misery was complete. Cairns was reached on Sunday the 6th, and in the afternoon I went out after insects. The heat was intense, it being just before the rains; but everything was new. On a dead tree on the sea-front I found many pretty little red and white striped Brenthids. At a spot where a marsh ran through the bush butterflies were fairly numerous. Here I took many specimens of that lovely Lycænid, *Arhopala amytis*.

The next four days were spent in the dense scrub lying between Cairns and the Barron River. Mosquitoes were very troublesome wherever there was any stagnant water, but at Freshwater, where there is a pretty little running stream, they gave no trouble. Here the magnificent *Papilio ulysses* was quite common, and on one day I took fourteen perfect examples. It is a grand sight to see this insect, a mass of black as it descends to the decoy from the tops of the highest trees, then suddenly turning and flashing all its dazzling blue in the sun, and after hovering for a moment returning whence it came. That grand butterfly *Ornithoptera cassandra* was to be seen constantly, lazily flopping in and out of the shady scrub. This butterfly has a habit of flying in the rain, and is generally to be seen at dusk, looking almost like a bird, and long after all other butterflies have retired for the night. Another beautiful insect in these low-lying scrubs was *Cethosia cydippe*, which is one of the most conspicuous butterflies I know, but this was far less common than the former insects. *Doleschallia australis* was very common, but difficult to get in good condition. The resemblance of the under side of this insect to a dead leaf is almost equal to the well-known *Kallima inachis*. *D. australis* has a habit of frequently settling amongst the dead leaves and twigs which cover the ground, but it also very often settles on leaves high up on the

lower trees. *Papilio sarpedon* was frequently taken at mud-holes, as *P. ulysses* was also once or twice. *P. lycaon* was noticed and stopped once as it flew swiftly overhead, following the course of a swamp. *Cynthia ada* was quite common, the males far outnumbering the females. Here also I obtained *Neptis shepherdii*, *Precis zelima*, *Neptis consimilis*, *Cupha prosopis*, and *Tellervo zoilus*.

Amongst the beetles, *Cicendela semicincta* was very common on the paths, whilst there were two or three arboreal species on the tree-trunks, but of these I only managed to capture a few of one species (*D. flavipes*). They have a habit of moving round the tree as one approaches, and are most difficult to take. I was late for Buprestidæ, and only took one or two species. There are still a few black fellows about in this district—poor little under-sized specimens of humanity. One day I met one armed with a spear and boomerang, and on another occasion one had a boomerang and a throwing-stick of some kind. Their huts are the roughest shelters I ever saw, and far too low for one to stand upright in. They simply consist of three long wands bent over in half circles, and crossing at a point at the top, and then loose thatch is roughly thrown over them.

At the end of the week I went up to Kuranda, above the Barron Falls, which lies nearly two thousand feet above sea-level. Here the bush takes a very different character, the dense undergrowth giving way, and one also misses the graceful Australian palm (*Livistona australis*); still the lawyer palm (*Calamus australis*), a climbing species armed with long tentacles studded with hooks, is as numerous and troublesome as ever. *Ornithoptera cassandra* was common here in all stages as below, but at this season *Papilio ulysses* seemed less numerous. I also took *P. agamemnon*, and one afternoon a large number of *P. macleayanus*. *Tellervo zoilus* was also very common, and, like *Ornithoptera cassandra*, does not seem to mind the rain. It is mimicked by the very rare little *Neptis staudingfreana* and one afternoon I was fortunate enough to capture three examples.

The rain was now descending daily, rendering collecting very difficult. A fresh source of annoyance appeared in the shape of small pencil leeches, which are very common in some parts of the bush. They fix themselves on to the clothing of passers-by, and one is not aware of their presence till one notices the blood-soaked garments. It is curious here to hear the chorus of frogs, which commences of an evening or just before rain sets in. Wasps are numerous up here, making their nests underneath the stairs (which are outside) and under the roofs of the balconies. They do not seem to cause any annoyance to the inmates. In the garden I met our old friend *Deiopeia pulchella*.

Other butterflies captured included *Hypolimnys alimena*, *Junonia vellida*, *Mynes geoffroyi*, *Danaïa hamata*, *D. chrysippus*,

Deudorix diovis, *Bindahassa sugriva*, *Megisba nigra*, whilst *Danis serapis* was very abundant. Many other Lycænidae and also Hesperidae were taken, but I have not yet identified them. Small ants were very troublesome here, attacking larvæ, pupæ, and perfect insects at every opportunity. Beetles did not seem so much in evidence as I had expected, but I took a beautiful pair of the magnificent *Phalacrognathus muelleri*. Round a large tree with a lilac-coloured flower were many green *Lomaptera duboulayi*, and I also obtained a few Longicorns. Whilst at Kuranda, Mr. Dodd kindly showed me some of the magnificent insects which he collects in this district.

On my return southwards I again called at Townsville, where I found things very different. Heavy rains were falling, and on the paths were swarms of *Cicendela semicincta* (both forms), where previously not one was to be seen. Birds, too, seemed more numerous, and I was particularly interested in some bee-eaters which were numerous along a watercourse which I followed.

I arrived at Sydney on February 1st, and paid a visit to the National Park. Although the wild flowers are extremely varied and beautiful here, there were very few butterflies and practically no beetles at this season to be found. The only butterflies noticed were species of *Xenica* and *Heteronympha* (*H. merope*), and one or two dull Lycænidae. From February 4th to 9th I was in Melbourne, but only two species of *Xenica* were taken, although I visited one of the best localities in South Victoria. Perhaps I should have done better here but for the rain, which interfered with outdoor work very considerably. During my whole stay in Australia constant rain handicapped me severely in outdoor work, whilst it rendered it very difficult to dry specimens and to prevent mould.

I left Melbourne (February 9th) by the steamship 'Salamis' for Durban, where we arrived on March 5th after a rough and dreary passage. Here I was particularly anxious to obtain some of the beautiful instances of mimicry which occur in this locality, and on the whole was very successful. On the first afternoon I went up the Berea, and into the Stella Bush, where I found insect-life apparently far more abundant than in any part of Australia, although one missed the gorgeous beauty of *Papilio ulysses* or *Ornithoptera cassandra*. Flowers are also far more conspicuous than in the Queensland scrubs, but the country seemed dustier, and lacked the fresh green of the palms, lawns, &c., so familiar in the tropical jungles of Northern Australia. One of the commonest butterflies here was *Pieris thysa*, but, strange to say, its model, *Mylothris agathina*, was quite scarce here, although I subsequently found it abundant enough up country. Another interesting butterfly which was unusually common was *Pseudacræa tarquinia*. This was to be taken daily

both here and later at Eshowe (Zululand). I obtained a beautiful example of *P. imitator* at Eshowe, where I also found *Eronia argia* not uncommon. *Papilio cenea* was very abundant, and I obtained all three forms of its female at Durban. Another fine mimic of which I obtained a few examples was *Euralia wahlbergi*, but I was evidently late for this insect, as most of my specimens were worn.

At Pietermaritzburg I found *Hypolimnas missippus* fairly common, and also took a very fine female at Amanzinitoti. In the South African bush are many grassy clearings, where the beautiful purple- or orange-tipped butterflies of the genus *Teracolus* swarm amongst the flowers, whilst such lovely *Lycænids* as *Iolus silas*, *I. sidas*, and *Deudorix diocles* are to be found amongst the stunted bushes which edge such clearings. The curious flat-topped acacias which so largely constitute the larger vegetation of South Africa were the haunt of many fine *Charaxes*, attracted by the gummy sap so frequently exuded from wounds on the branches. In such places I captured *Charaxes zoolina*, *C. neanthes*, *C. varanes*, *C. brutus*, *C. cthation*; whilst at Eshowe I also obtained *C. candiope* and *C. xipares*. Other butterflies which swarmed in such localities were *Crenis boisduvali* and *C. natalensis*, and I also found amongst them a few Coleoptera, with which was *Endicella smithi*. A feature of the South African bush is the numerous paths going in all directions, and here were to be obtained the two Cicendelidæ, *C. clathrata* and *C. disjuncta*, the latter haunting the more shady spots.

In the darker portions of the bush *Melanitis leda* was common, whilst once or twice *M. diversa* was also taken. Towards the end of March *Salamis anacardii* became quite common, and I also obtained two *S. nebulosa*—the one at Durban (March 15th), and the other at Eshowe (April 1st). Quite a feature of the bush here were the beautiful fruits—scarlet, yellow, or purple, some smooth and others covered with spines—which grew on the creepers which trailed over every bush; whilst a newcomer could not help but be attracted by the monkeys, families of which were to be met with daily, anywhere where there are any trees left. Amongst the many butterflies haunting the native paths in the Stella Bush I noticed *Neptis agatha*, *N. goochi*, *N. marpessa*, *Eurytela hiarbus*, *E. dryope*, *Hypolycaena phillipus*, *Pentila tropicalis*, and many species of *Acræa*; whilst on the lantana bushes which grow round the edge of the bush were swarms of *Papilio demoleus*, *P. lyæus*, *P. brasidas*, and *Junonia clelia*. Up country *J. cebrene* was very common, and I took one specimen of *J. boopis* at Aooa. At this latter place I found *Teracolus auxo* extremely common along the roadside, together with a few *Eronia leda*.*

* In one garden on the Berea I took a nice series of *Myrina demaptera* which were quite abundant in one tree, frequently settling on the under sides of the leaves.

On March 24th I went up to Eshowe, in Zululand. The country here lies high, and is well-watered. One particular stream was very beautiful, flowing in a series of falls and rapids, the falls sometimes being sixty feet to eighty feet high. Here I saw several times but failed to capture *Papilio ophidicephalus*. On one occasion I actually broke the tails off one, and then it escaped. Up here, and also on the South Coast, *Harma alci-medæ* was abundant, and amongst them I took several male *H. coranus*. Another nice insect, which I only took here, was *Hypolycaena buxtoni*, of which I took several examples along the paths. Probably the commonest butterfly here was *Lethe indosa*, which haunted the more shady portions of the bush. In the open, on the grass veldt, were many examples of the genus *Precis*.

I then returned to Durban, where I found things getting much scarcer. On the sand just above high-water mark I took a nice series of a *Cicendela*, which absolutely matched the colour of the sand on which it was in the habit of running. A big electric light in the Musgrave Road yielded many moths and a few beetles, amongst which I obtained a new Longicorn (*Gahania simmondsi*, Dist.). A visit to Pietermaritzburg and Howick yielded a nice series of *Alena amazoula*, and I also saw *Papilio ccherioides* on one of the hill-tops, but failed to effect a capture. The last two or three days were spent at Amanzinitoti, on the South Coast, but the only fresh things obtained here were *Deudorix antalus* and a single specimen of *Hamanumida dædalus*. This ended my collecting in South Africa, except for a few hours at Cape Town, on the Lion's Head, where I only obtained a few Lycenidæ.

I have by no means given a full list of the species taken, but only of the more interesting ones. I left Durban on April 19th by the turbine steamship 'Miltiades,' and after a very pleasant trip reached London on May 13th.

A NEW SPECIES OF *TREMEX* (SIRICIDÆ) FROM BORNEO.

By P. CAMERON.

Tremex viridiceps, sp. nov.

Black; the head dark green, densely covered with long white pubescence, the thorax largely tinged with a darker green, a large triangular mark on the sides of prothorax, metanotum, the first abdominal segment, except narrowly in the middle, and broad bands on the sides of the second to fourth abdominal segments, pale yellow; the tibiæ and tarsi dark testaceous, the posterior darker coloured than the four anterior. Wings hyaline, the radial cellules and the apex

smoky, the stigma dark testaceous, the costa and other nervures black. ♀. Length 11 mm.

Kuching. October (J. Hewitt).

Head and thorax closely strongly punctured, the head more strongly than the latter. Antennæ from the third joint flattened, the third narrowed, of equal width. Pubescence longer and denser on the front than on the rest of the head. Antennæ 14-jointed, the joints towards the apex bearing short stiff black hairs. Ovipositor short, narrow.

T. insularis, Sm. from Sarawak I do not know, but from the description I would separate it from the present species thus:—

Apical joints of antennæ yellow, only the first two and	
the last abdominal fasciæ interrupted, the others	
continuous	<i>insularis</i> .
Antennæ entirely black, the abdominal marks all widely	
separated	<i>viridiceps</i> .

SOME BEES COLLECTED BY DR. F. C. WELLMAN IN WEST AFRICA.

By T. D. A. COCKERELL.

Mesotrichia chiyakensis, sp. nov.

♀. Length, 30 mm. or a fraction less; anterior wing about 26 mm.; width of head, $10\frac{1}{2}$ mm. Black, with bright lemon-yellow hair on the mesopleura, the hind margin of thorax, and the first abdominal segment; hair of face and anterior part of thorax, and also of legs and abdomen except first dorsal segment, coarse and black. Vertex broad, shining, with very sparse but strong punctures; frontal keel low, grooved, not nearly reaching clypeus; third antennal joint longer than 4 + 5; mesothorax densely punctured at the sides, the disc smooth and impunctate; wings exceedingly dark.

Hab. Chiyaka, Benguella, West Africa, September 1st, 1907; at flowers of mint (F. C. Wellman, 1239).

A very fine species, of the general type of *Mesotrichia caffra* (L.), but larger, and with yellow hair on the pleura. It belongs to a little group typified by *M. inconstans* (Smith), separable thus:—

- | | |
|---|--------------------------------|
| Length, 26–26 mm.; anterior wing, 21–23 mm. | 1. |
| Length, 30 mm.; anterior wing, 26 mm.; scutellum | |
| with yellow hair | <i>M. chiyakensis</i> , Ckll. |
| 1. Scutellum and first abdominal segment with white | |
| hair (Abyssinia, White Nile, Tanganyika) | <i>M. inconstans</i> (Sm.). |
| Scutellum with yellow hair (Senegal) | <i>M. flavescens</i> (Vachal). |

In 1881 Radoszkowski recorded *M. inconstans* from Humbe, to the south of Benguella. That this was the genuine *inconstans* I cannot believe; it may possibly have been *chiyakensis*.

Ceratina geigeriæ, sp. nov.

♀. Length about $7\frac{1}{2}$ mm. (8 with head thrust forward); black; strongly and very densely punctured, including the disc of the mesothorax; wings strongly darkened; clypeus with a broad dull yellow band; tubercles yellow; a cream-coloured stripe on anterior femora beneath, and the basal half of their tibiæ above, and a very small spot at base of hind tibiæ; no distinct keel on apical segment of abdomen; hind margins of segments punctured; apex a broad triangle.

In Friese's table of African *Ceratina* it runs to *C. sulcata*, which I have from Dr. Brauns. It is, indeed, very close to *sulcata*, but differs from the South African species by the clypeal mark being rounded above, not expanded laterally, the absence of a shining space just above the sides of the clypeus, the darker flagellum, and the smaller size. The middle of the clypeus is not distinctly sulcate, as it is in *sulcata*.

C. lineola, Vachal, from Delagoa Bay, must also be very similar, but its wings are scarcely infumated. It is also a little smaller.

Hab. Chiyaka, Benguella, West Africa; at flowers of *Geigeria*, September 1st, 1907 (F. C. Wellman, 1241, part). *Geigeria* is a genus of Compositæ.

Gronoceras nigrocincta (Rits.).

Chiyaka, Benguella, September 1st, 1907; one female found dead in a spider's web (F. C. Wellman). This fine species agrees well with Ritsema's coloured figure of *Megachile nigrocincta*. It is evidently a *Gronoceras*; indeed, Ritsema remarks that it is close to *G. combusta*. The mandibles have two apical teeth, and a long inner cutting edge; clypeus with a little broadly truncate process on middle of apical margin; claws simple; hair of head, thorax, legs, and first abdominal segment black; of rest of abdomen bright red; scopa red, black at extreme base; wings strongly smoky. Length 21 mm. or a little more.

Halictus hotoni, Vachal. (♀).

Chiyaka, Benguella, September 1st, 1907; at flowers of *Geigeria* sp. (F. C. Wellman). Previously known from a single female from Delagoa Bay. The specimen agrees with Vachal's description, except that the anterior tibiæ have a suffused dark patch. The general appearance is just like that of *H. aureolus*, Perez, but the arrangement of the hair on the abdomen is different.

Halictus geigeriæ, sp. nov.

♀. Between 6 and $6\frac{1}{2}$ mm. long; black; with short greyish-white hair; head rather large, dull, and finely roughened; clypeus produced; flagellum short, only faintly brownish beneath; mesothorax dull, with close minute punctures, except on each side of the middle, where they are sparse, though the surface still remains dull

the middle line of the mesothorax is quite strongly sulcate, and the punctures are dense along this depression; sides of thorax with rather copious white hair; tegulæ black or very nearly so; area of metathorax well defined, minutely but very strongly cancellate; scutellum obtusely bigibbous; heart-shaped posterior face of metathorax with sharp borders; legs black, with coarse white hair; last tarsal joint rufous; hind spur of hind tibia serrate, the teeth evident; wings dusky hyaline, not yellowish; stigma and nervures piceous; third t. c. and second r. n. weakened; first r. n. joining second s. m. at its extreme apex, but not quite meeting the second t. c.; abdomen moderately shining, the punctures very minute; triangular patches of white pubescence at lateral bases of segments 2 to 4, very conspicuous; no apical bands, and the apical margins black like the rest.

Hab. Chiyaka, Benguella, September 1st, 1907; flying with *Ceratina geigeriæ* at flowers of *Geigeria* sp. (F. C. Wellman).

General appearance like that of *H. opacus*, Perez, but *opacus* has the mesothorax shining, with very much larger and stronger punctures. *H. geigeriæ* belongs to the group of *H. quadrinotatus* (Kirby) and *H. sexnotatus* (Kirby)—a group characteristic of the Northern Hemisphere.

University of Colorado, Boulder, Colorado:
November, 1907.

RECENT BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE RHYNCHOTA.

By W. L. DISTANT.

MR. KIRKALDY (*ante*, p. 14), in reference to the genus *Platylomia*, Stål, writes:—"Distant says that this was not described by Stål, and was only a name in 1870. On the contrary, it was described by Stål (in the place cited by Distant), who doubtfully ascribed *flavida*, Guérin, as the type." The plain interpretation of such a statement is that I overlooked the description, and made an erroneous report thereon. So far from this being the case, I had previously (*Ann. Mag. Nat. Hist.* (7), xv. p. 65 (1905)) fully explained my reasons for considering Stål's short description as inadmissible, though retaining his name for the genus. Reference to this opinion is under the genus in my Catalogue, which Mr. Kirkaldy has ignored. I also referred as to the description of the genus to *Faun. B. I. Rhynch.* iii. p. 100 (1906), a book which Mr. Kirkaldy possessed, as he has elsewhere made several references thereto, and there I repeated the course I had pursued. The character given by Stål, "*ramo venæ ulnaris interioris recto vel leviter curvato*," was evidently taken from Guérin's figure, a character, as I stated, "given by the artist and not found in the species." Therefore, *flavida*, Guér.,

as thus described, could not be taken as the type, and I selected *spinosa*, Fabr., as available. Mr. Kirkaldy asserts that this "is invalid in any case, as Stål places it at the head of his sub-genus *Cosmopsaltria*." Of the latter genus Stål had (Berl. Ent. Zeitschr. x. p. 170 (1866)) previously fixed the type as *C. doryca*, Boisd., including in it both *spinosa*, Fabr., and *flavida*, Guér. These species cannot, however, be regarded as congeneric with Boisdual's *doryca*, and Mr. Kirkaldy's contention is untenable, while he has placed a forced interpretation on my sentence ("nom. nec descript.").

With the other opinions of Mr. Kirkaldy I am not concerned; I merely wish to correct his statements, and to desire accuracy in criticism.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC HEMIPTERA).

BY G. W. KIRKALDY.

(Concluded from vol. xxxix. p. 157.)

I COMMENCED this "Guide" in August, 1898, in the thirty-first volume of the 'Entomologist,' and certainly never anticipated that ten years would pass before it was completed. This slowness has been due to causes beyond my control, primarily to my removal to the Hawaiian Islands, and secondly to a severe accident which has sadly delayed all my work; but I trust that the irregular appearance of these hints on the study of, perhaps, the most fascinating, morphologically and biologically, of all the Hemiptera—that is to say, of all animals—has not discouraged any of my readers who may have felt some inclination to study them.

I proposed to provide a list of all the British species, with their county distribution, but the publication, mostly since I left England, of the 'Victoria Natural History' series, none of the volumes of which I have seen, has compelled me to omit this part of my plan.

Later on I hope to revert to this subject, but I think that it is better to close the "Guide" at this point, hoping that the Editor will allow me to make further observations at some future time.

The following corrections should be made:—

Vol. xxxii. p. 296, line 1 of the table, read "First segment of middle tarsi not more than $2\frac{1}{2}$ times as long as the second," . . . and the corresponding entry, "First segment of middle tibiæ rarely (if ever) less than three times as long as the second segment."

Vol. xxxiii. p. 150, for "figs. 31-4" read "31, 32, 34"; for "figs. 35-9" read "35-6"; delete "40-."

ON THE VARIETIES OF *PYRRHOSOMA TENELLUM*
AND *P. NYMPHULA*.

BY KENNETH J. MORTON, F.E.S.

As is well known, the female of *Pyrrhosoma tenellum*, De Villers, assumes two strongly marked deviations from the normal form, namely, one which has the abdomen black-bronze, and the other which has the abdomen crimson like that of the male. Mr. Lucas (Entom. 1901, p. 68) names these forms *æneatum* and *rubratum* respectively. He remarks that Dale took the former in Dorset, and he mentions De Selys' references in the 'Revue,' p. 181, to both forms. De Selys there gave no names. Subsequently, however, in the 'Synopsis des Agrionines,' 5me legion : Agrion, pp. 185-6 (separate), the bronzed female is named *melanogastrum* (from Dorset, Syracuse, and Algeria), while the crimson female is named *erythrogastrum*. The intermediate form to which Mr. Lucas also alludes is called by De Selys *intermedium*.

And so, too, with *Pyrrhosoma nymphula*, Sulzer. The dark form (*æneatum*, Lucas) with yellow instead of crimson markings is named by De Selys (*l. c.* p. 188) *melanotum*, the localities stated being Madrid, Dorset, and Corfu. I possess it from the Sierra Albarracin, Spain (Miss Fountaine).

The Selysian names must naturally have priority.

13, Blackford Road, Edinburgh: January, 1908.

A NEW *PSEUDAGENIA* FROM SIKKIM.

BY P. CAMERON.

Pseudagenia bidens, sp. nov.

Black; pruinose, wings hyaline, a cloud along the transverse median and transverse basal nervures, the cloud narrow in front, becoming gradually widened behind; a wider cloud commencing shortly behind the first transverse cubital nervure and extending to the second recurrent nervure; the nervures and stigma black, Apex of clypeus rounded, its middle with two distinctly separated, stout teeth, bluntly rounded at the apex. ♀. Length, 9 mm.

Eyes converging above; the ocelli in a triangle, the hinder separated from each other by a less distance than they are from the eyes. Apex of mandibles brown; the palpi black, tinged with fuscous and covered with white pubescence. Thorax long; the apex of pronotum broadly rounded. Post-scutellum finely, irregularly striated in the middle. Apical slope of metanotum with a shallow finely irregularly striated furrow down the middle. The upper part of metapleuræ is separated from the lower by a distinct furrow, which has a few

striæ. The long spur of the hind tibiæ reaches to the middle of the metatarsus; there is a distinct tooth on the base of the claw. The first transverse cubital nervure is broadly roundly sloped; the third has the front half obliquely sloped towards the stigma.

Belongs to Bingham's Section E, *a, a*. Characteristic are the two distinct teeth on the apex of the clypeus.

NOTES AND OBSERVATIONS.

THE ENTOMOLOGICAL CLUB.—A meeting was held on January 14th, 1908, at the Entomological Salon of the Holborn Restaurant, Mr. G. H. Verrall in the chair. Other members present were Mr. R. Adkin and Mr. H. St. John Donisthorpe. Between half-past six o'clock and 8.30 p.m., when supper was served, over seventy guests had assembled. In his speech after the repast Mr. Verrall made sympathetic reference to the death of Mr. A. J. Chitty (a member of the Club), and of Mr. M. Jacoby, who had on so many meetings of the Club in that room contributed to the harmony of the evening by his brilliant performance on the violin. The Honorary Secretary submitted a list of the names of past and present members of the Club, dating from its foundation by George Samouelle in 1826; this showed a total of fifty during the eighty-two years. In addition to the membership roll a set of forms had been prepared, which, when filled up with the requisite particulars of their respective entomological careers and achievements, would furnish material for a biographical sketch of each member. Such records would then be inscribed in an elaborately bound and suitably ruled volume presented to the Club by Mr. Robert Adkin on Jan. 22nd, 1907. Mr. Henry Rowland-Brown and Mr. Alfred Sich were elected honorary members of the Club.

SYMPETRUM VULGATUM.—Some doubt has been raised as to the Hull specimen of this rare British dragonfly in the "Dale" collection, now located in the Hope Department of the Natural History Museum in Oxford. I have lately examined the cabinet containing the dragonflies and find a female specimen with a label, apparently in J. C. Dale's handwriting, stating that it came "from Mr. Harrison of Hull, 1837." There are also three other specimens—two males and a female—but these bear neither date nor locality.—W. J. LUCAS; Kingston-on-Thames.

SURINAM COCKROACHES AT KEW. — Of late years *Leucophaea surinamensis* has been noticed on one or two occasions in England. Apparently it has taken up its abode and intends to stay in Kew Gardens. "Handsome is as handsome does," I suppose; but, much as the authorities there would prefer its room to its presence, it is, nevertheless, an interesting little "beast," of very elegant proportions, and will not disgrace the orthopterist's cabinet.—W. J. LUCAS; Kingston-on-Thames.

PIERIS BRASSICÆ LARVÆ IN JANUARY. — On January 4th, at Rayleigh, Essex, I found three larvæ of *Pieris brassicæ*, which had

apparently just crawled up a timber-built building for pupation; two had already begun spinning themselves up. The temperature at the time (midday) was cold but sunny; the thermometer registered four degrees of frost; since the 1st it had continued freezing. It is remarkable for these larvæ to survive for three months, as must have been the case; undoubtedly the eggs were deposited in September, 1907, and most likely early in that month, which would extend their larval duration to nearly four months, and to find them full-fed in January during frost is, I should imagine, unprecedented. They have since pupated: one on the 10th, the remaining two on the 11th and 14th, the transformation, as will be seen, occupying several days. F. W. FROHAWK.

NOTES ON EUPITHECIA TOGATA.—Last autumn I fixed a day for collecting larvæ of this fine "pug." Owing to the backward season I made the date a few days later than usual. It is advisable to obtain the larvæ full-grown, as there is then greater certainty that they will pupate successfully, and one may chance to find a few of the larvæ spun up in the cones. When I arrived at the district and had a look round, very few new cones were to be seen; but after further search I found a tree which bore many of the desired cones. They were situated near the top of the tree, and rather difficult to get at. I am a fairly good climber, however, and up the tree I went. To my delight every cone was infested with the larvæ; in fact, some of the cones had three or four larvæ in them. Never before had I observed so many larvæ in a single cone. It appeared to me all the female *E. togata* in the district had visited this tree to deposit their ova on the new cones. *E. togata* is not always to be found where spruce fir grows, even although the trees may bear numerous cones. The moths do not always emerge the following June, a good number of them lying over till the second year. The perfect insect is seldom seen on the wing, and is difficult to find on tree-trunks. From 1899 to 1904, although constantly on the look-out, I failed to see any cones which bore traces of the larvæ; I began to think the cold, wet seasons had swept them completely away. If June proves warm and there is then a fair amount of sunshine, the chance of larvæ of this species in the autumn is good.—R. LAWSON; Croft Park, Craigie, Perth, N.B.

MACROTHYLACIA RUBI IN WINTER.—On the 13th January, 1908, I took some hibernating larvæ of *M. rubi* from a turf in the open on which I had been keeping them (eighteen in all). They were then frozen so much that they could be snapped in pieces like pieces of stick; I then put them in a greenhouse about twelve o'clock; by three o'clock they had thawed and were beginning to move about, and on the following Wednesday the greater number had begun to spin cocoons. All except five have now spun up, and these five have produced pupæ of some parasite.—FRANCIS C. WOODBRIDGE; Northcroft, Uxbridge, January 22nd, 1908.

NEW AND COMPLETELY ILLUSTRATED WORK ON THE LARVÆ AND PUPE OF THE BRITISH MACRO-LEPIDOPTERA. — May I earnestly solicit the help of entomologists for this work. Loans or gifts of

larvæ or pupæ would be greatly valued, and I should have much pleasure in forwarding a list of my requirements to anyone willing to help. Many eminent workers have given, and are still giving, valuable assistance. Drawings and descriptions of the larvæ and pupæ of three-fifths of the species are completed; forty-five species are partly completed, and at least fifty of the rarer species, or occasional immigrants, will require to be drawn from continental larvæ and pupæ.—W. A. ROLLASON; Lamorna, Truro, Cornwall, January 20th, 1908.

ADDENDUM.—Page 24, last line add T. A. C.

CAPTURES AND FIELD REPORTS.

AGROTIS LUNIGERA AND LUCERNA IN SUSSEX.—Mr. Sharp, of Eastbourne, while collecting Noctuæ at sugar, upon the coast not far from Seaford, captured specimens of both these species, but only in small numbers. On a subsequent occasion I accompanied him to the locality and we then obtained *obelisca*, in addition to the above-named. I think this very interesting, for, as far as I can find, this is the first record of either *A. lunigera* or *A. lucerna* for Sussex.—A. J. C. WIGHTMAN; Ailsa Craig, Lewes.

L. VITELLINA IN SUSSEX.—While collecting at ivy-bloom in the Lewes district on October 19th, I had the good fortune to take a male specimen of *L. vitellina* which, however, was rather worn. My friend Mr. Sharp, of Eastbourne, also took a female specimen in the neighbourhood of Polegate about a week previously; his specimen was also somewhat worn.—A. J. C. WIGHTMAN; Ailsa Craig, Lewes.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—The Annual Meeting of this Society was held on Wednesday, *January* 15th, at their rooms in Chandos Street, Cavendish Square, Mr. C. O. Waterhouse, President, in the chair, when the following Fellows were elected as officers and to serve on the Council for the session 1908-9:—President, Mr. C. O. Waterhouse; Treasurer, Mr. A. H. Jones; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander J. J. Walker, M.A., R.N., F.L.S.; Librarian, Mr. G. C. Champion, F.Z.S.; other members of the Council, Dr. T. A. Chapman, M.D., F.Z.S., Mr. A. Harrison, F.L.S., F.C.S., Mr. W. J. Kaye, F.L.S., Dr. G. B. Longstaff, M.D., Mr. H. Main, B. Sc., Mr. G. A. K. Marshall, Prof. R. Meldola, F.R.S., F.C.S., Prof. L. C. Miall, F.R.S., Prof. E. B. Poulton, D.Sc., M.A., F.R.S., Mr. R. Shelford, M.A., C.M.Z.S., Mr. G. H. Verrall.—The Report for the session 1907-8 showed that the Society had increased considerably, and that the number of Ordinary Fellows exceeded that of any previous year in the Society's history since its

foundation in 1833. The President then read his address, which dealt chiefly with the present unsatisfactory state of nomenclature in entomological science. He also advocated the establishment of a central "type" museum, on the lines of an experimental collection now formed at South Kensington, for the purpose of loaning specimens to institutions, whereby it was suggested that the existing confusion might be avoided, and the general work of identification made easier.—Mr. F. Merrifield proposed a vote of thanks to the President for his address, and Professor R. Meldola proposed a similar vote for the Officers of the Society, to which the President, the Treasurer, and the Secretaries replied.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Thursday, December 12th, 1907.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. H. W. Andrews, F.E.S., of Welling, was elected a member.—Mr. Newman exhibited (1) a large number of pupæ of *Pieris napi* spun up on the top of the cage, showing a large range of colour variation; (2) an example of *Ennomos autumnaria* devoid of speckled markings and with red tips of wings; (3) a very dark *Melitæa athalia* from Devon; and (4) examples of *Drepana harpagula* and *Trigonophora flammea* taken some years ago.—Mr. Tonge, a number of stereographs of entomological subjects, which were exhibited in the stereoscope kindly presented to the Society by Mr. Fremlin.—Mr. Kaye, a series of *Acidalia humiliata* from the Isle of Wight, and noted that they were smaller and less strongly coloured than continental specimens.—Mr. South, a bred series of *Eupithecia castigata*, showing none of the brown suffusion usual in captured specimens.—Mr. Adkin, a series of *Teras contaminana* from Polegate, and pointed out the extreme variation shown in the short series.—The following members exhibited selected specimens, series, and broods of *Pieris napi* and its various forms from English, Scotch, Irish, and continental localities: Messrs. Harrison, Main, Montgomery, Rayward, Newman, Joy, Turner, Grosvenor, Garrett, Sich, Adkin, Dr. Chapman, and Dr. Hodgson.—Mr. Main then read a short paper, "Some Notes on *Pieris napi*," and a considerable discussion ensued.—HY. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Annual Meeting held at the Royal Institution, Liverpool, on *December 16th, 1907.*—Mr. Wm. Mansbridge, Vice-President, in the chair.—The following members were elected officers of the Society for the ensuing year, *viz.*—President, Samuel J. Capper, F.E.S.; Vice-Presidents, Prof. E. B. Poulton, F.R.S. (Oxford), J. R. Charnley, F.Z.S., H. H. Corbett, M.R.C.S. (Doncaster), Wm. Mansbridge, F.E.S., Eustace R. Banks, M.A., F.E.S. (Corfe Castle), Robert Newstead, A.L.S.; Hon. Treasurer, J. Cotton, M.R.C.S., F.E.S.; Hon. Secretaries, H. R. Sweeting, M.A., Wm. Mansbridge; Hon. Editor, J. R. le B. Tomlin, M.A., F.E.S.; Hon. Librarian, F. N. Pierce, F.E.S.; Council, the Rev. T. B. Eddrup, M.A. (Wakefield), C. E. Stott, Robert Tait, Jr., P. Edwards, M.R.C.S., J. Collins (Oxford), R. Wilding, O. Whittaker, Wm. Bell, J.P., M.R.C.S., E. G. Bayford (Barnsley), P. F. Tinne,

M.A., W. D. Harrison, and W. A. Tyerman.—The Vice-Presidential address was then delivered by Dr. J. Harold Bailey, of Port Erin, Isle of Man, and was entitled "The Coleoptera of the Isle of Man." Dr. Bailey dealt with his subject in a most illuminating and scientific manner; he described the climate and topography of the island exhaustively, showing the influence of the ocean currents and prevailing winds upon the flora and fauna. The geological structure of the island was also considered, so far as related to the beetles and their distribution in this interesting area. Dr. Bailey discussed the probable date when there must have existed a land connection between the coast of Ireland on the west and that of Lancashire on the east, as evidenced by the numbers of various classes of Coleoptera and plants belonging to different periods of migration. Lengthy comparisons were made in this connection between the numbers and species of the different migrations, as now existing on the adjacent coasts, as well as in the case of the Alpine forms found on the Manx mountains and in the highlands of Scotland and Ireland. As this paper will be bound up with the new list of the Coleoptera of Lancashire and Cheshire shortly to be published by the Society, it is hoped that it will be read by all students of the distribution of insects. A vote of thanks to Dr. Bailey having been proposed and suitably replied to, the following exhibitions were made, *viz.*—Mr. C. B. Williams, a fine female example of the olive-banded form of *Bombyx quercus*, bred, 1907, from a Wallasey larva; Mr. Robert Newstead, a case showing the complete life-history of the common house-fly, which he had worked out, in his usual painstaking and thorough manner, during the past summer; Mr. J. J. Richardson, about seventy species of Lepidoptera taken from the lamps round Sefton Park, Liverpool, during 1907. These included a variety of *Halia vauaria*, *Noctua rubi*, *Plusia iota*, *P. pulchrina*, *Epione apiciaria*, *Eugonia alniaria*, *Himera pennaria*, *Leucoma salicis*, and *Cymatophora duplaris*.—H. R. SWEETING and Wm. MANSBRIDGE, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—November 18th, 1907.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. Leslie Frederick Burt, Edgbaston, was elected a member.—Mr. J. T. Fountain exhibited a long and variable series of *Apamea testacea*, Hb.—Mr. H. W. Ellis showed various Coleoptera: *Lathrobium lævipenne*, Heer, a species not long known as British, of which he found six specimens in the Blatch collection from Knowle, Bewdley, and Cannock; and he had also taken it at Knowle; *Agabus affinis*, Pk., from Sutton. He said that he had previously also recorded *A. unguicularis*, Thoms., from thence, but that on sending the specimens to Mr. Balfour Brown they all proved to be *affinis*; *Dermestes vulpinus*, F., from Fareham, where the larvæ were eating the wooden beams in a manure factory.—Mr. G. T. Bethune-Baker showed butterflies of the genus *Epinephele*, chiefly from Turkestan.—Mr. Hubert Langley, *Lobophora carpinata*, Bkh., from Princethorpe Wood, and said that he had also taken *L. halterata*, Hufn. there.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—November 19th 1907.—Rev. C. R. N. Burrows exhibited *Camptogramma fluviata*

male, taken at sugar at Mucking, October 2nd, 1907. — Mr. A. Harrison, *Zygæna minos*, Carnarvon, 1905 and 1907. The 1907 specimens were smaller and more thinly scaled than those taken in 1905, difference possibly due to the inclement season in 1907. — Mr. G. G. C. Hodgson, *Zygæna trifolii*, Sussex, early July, 1907, including six spotted specimens and three extreme examples of melanism with black hind wings and only a trace of the spots on fore wings. — Mr. L. W. Newman, a dark brown, almost black, specimen of *Oporabia dilutata*, Bexley, October, 1907. — Mr. A. J. Willsdon, a gynandrous *Crocallis elinguaris* from Manor Park; also specimens taken in 1907 in this district, being heavily specked with brown, and altogether much darker than a specimen taken in the same district twenty-five years ago. Another example from Torquay showed a very dark central band and strongly marked marginal spots.

December 3rd. — Mr. J. A. Clark exhibited *Vanessa antiopa*, Walthamstow; 1872. — Dr. G. G. C. Hodgson, *Hesperia comma*, from Surrey, including a male with cream ground colour and another male with under side as dark as in normal female. — Mr. L. W. Newman, three cocoons of *Dicranura bicuspidis*, containing living pupæ, found on birch-trunks in Tilgate Forest. — Mr. J. Riches, on behalf of Mr. Dewey, of Eastbourne, very dark specimens of *Epunda litulenta* and *Scopelosoma satellitia*, and a uniformly brick-red example of the latter species. — Mr. L. A. E. Sabine, *Oporabia autumnata*, from Tilgate Forest, including a pale grey specimen with slightly darker broad central band on fore wings. — Mr. A. J. Willsdon, dark *Agrotis puta*, from Torquay. The following gentlemen were elected as Council for 1908: President, Mr. A. W. Mera; Vice-Presidents, Dr. T. A. Chapman and Messrs. J. A. Clark, F. J. Hanbury and L. B. Prout; Treasurer, Mr. P. H. Tautz; Librarians, Messrs. G. H. Heath and V. E. Shaw; Curators, Messrs. G. G. C. Hodgson and A. J. Willsdon; Secretaries, Messrs. S. J. Bell and T. H. L. Grosvenor; Non-official members, Rev. C. R. N. Burrows and Messrs. H. M. Edelsten, E. Harris, J. Riches, and A. Sich.

December 17th. — Dr. T. A. Chapman exhibited *Vanessa urticæ* from North Lapland larvæ; the specimens were slightly smaller, darker, and brighter than normal British *V. urticæ*, and the brood included some examples of *ab. polaris* said to be common in these latitudes. — Mr. E. A. Cockayne, various Lepidoptera from East Aberdeen, 1907, including very dark *Xylophasia polyodon* and *Noctua xanthographa*, a red form of *Noctua neglecta*, dingy yellow-brown *Crocallis elinguaris*, and a single *Agriopsis aprilina* with usual bright green ground colour replaced by pale grey-green. — Mr. E. Harris, fine male and female *Augosoma centaurus* from Gold Coast. — Dr. G. G. C. Hodgson, *V. urticæ*, from Aberdeen, with a slight trace of a third spot above the two usual central black spots on fore wings; also a specimen from Surrey with these spots almost obsolete. — Mr. L. W. Newman, for Mr. G. B. Oliver, *Zygæna minos* and *Z. filipendulæ*, from North Argyle, and a six-spotted *Zygæna* with fluffy body, from the same district, suggesting that the two species hybridize there. — Dr. H. C. Phillips, a specimen of *V. urticæ* with pale yellowish ground colour, from Birchington. — Mr. V. E. Shaw, *V. urticæ* *ab. atrebatensis* (Bdv.), Bexley, August, 1905; also, from same district,

specimens of *V. urticae* with upper and two central spots on fore wings almost obsolete, and the lower much smaller than usual.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

Accouplement des Œufs, et Amour Maternel des Forficulides. By H. GATEAU DE KERVILLE. Pp. 31. Three figures in text. Rouen. 1907.

IN this most interesting paper the author has collected published information, and added observations of his own, concerning three points in the life-story of the Earwigs. The last and most interesting, first noticed by De Geer (1773), is the one to which most space is given. A large field, however, is still open to entomologists in this connection, for but nine species have thus far come under observation. These are:—1. *Forficula auricularia*, L. 2. *F. lesnei*, Fin. 3. *Chelidura aptera*, Charp. 4. *C. pyrenaica*, Géné. 5. *Anechura bipunctata*, F. 6. *Anisolabis maritima*, Géné. 7. *A. mauritanica*, H. Luc. 8. *A. littorea*, White. 9. *Labidura riparia*, Pall. Of these, 1, 2, and 9 are British species, while 6 has been taken casually in this country.

W. J. L.

The Annals of Scottish Natural History. Edinburgh. 1907.

ONCE more the editors have provided us with an interesting volume, and although again it is mainly concerned with things non-entomological, still there are a number of articles which it will be necessary for entomologists to consult. W. Evans has notes on "Tabanidæ at Aberfoyle"; "*Præmachilis hibernica* in Scotland"; "Some Pezomachi and other Cryptinæ from Forth"; "A New Louse (*Hæmatopinus ovillus*) from the Sheep," with a figure; and "*Gryllus domesticus* in an old quarry near Edinburgh." P. H. Grimshaw treats of "*Chærocampa celerio* at Galashiels"; "*Hydrotæa borussica*," a fly new to the British list; and "The Diptera of St. Kilda." P. Cameron has articles on "Scottish species of *Oxyura* (Proctotrypidæ)," "Scottish Cryptinæ (Ichneumonidæ)," and "Nocturnal and Alpine Hymenoptera." In addition we find "Lepidoptera from West Ross-shire, &c.," by D. Jackson; "*Sirex gigas* in South-West Scotland," by H. Maxwell; "Some Lepidoptera from St. Kilda," by C. G. Hewitt; and "A Note on *Eristalis tenax*," by R. D. R. Troup.

W. J. L.

The Little Naturalist in the Country (The "Little Naturalist" Series). By Rev. THEODORE WOOD, F.E.S. London: Ernest Nister. 1907.

AT once the dainty appearance of this little book creates a favourable impression, which is enhanced as we look one by one at the numerous good illustrations, which appear to be quite original. The text describing four walks "across the fields, down the lane, through

the wood, and back along the banks of the stream"—one walk for each of the four seasons—is very suggestive to the budding naturalist. One little grumble we must be allowed—instead of "animals and birds and insects," we feel bound to ask for "birds, insects, and *other* animals," especially as the book is intended for beginners. Everyone separates living things into two groups—animals and plants. If birds and insects are not animals, what are they?

W. J. L.

Preliminary Report on the Habits, Life-cycle and Breeding-places of the Common House-fly (Musca domestica), as Observed in the City of Liverpool. By R. NEWSTEAD, A.L.S., F.E.S. Liverpool. 1907.

WE have here a report of more than ordinary importance, and it is unfortunate that copies can be obtained apparently only at the Town Clerk's Office in Liverpool. We have always looked upon the House-fly as a nuisance at the best; after reading this report, especially that part relating to its breeding-places, we scarcely like to think what it might become at its worst. Various means of reducing the numbers of the House-fly are suggested, and apparently it has one very effective enemy in the domestic fowl. The parasitic fungus, *Empusa muscæ*, that kills so many House-flies in the autumn, is not mentioned—perhaps no use can be made of it. Apparently there still appears to be not much known about the winter condition of this insect.

W. J. L.

OBITUARY.

HENRY GUARD KNAGGS, M.D.

HENRY GUARD KNAGGS, M.D., was born in High Street, Camden Town, on March 21st, 1832, and was educated at University College School. His father, a medical man himself, had him trained up in his own profession at University College Hospital, after which he married, and started in practice in Kentish Town, afterwards removing to Camden Town. As a young man he interested himself greatly in entomology, and formed one of the finest collections of British Lepidoptera in England. He also became a member of the Entomological Society of London. During the sixties, the numerous entomologists who then lived in the north of London constantly used to meet at his house, or to walk home in parties together after the meetings of the Entomological Society. Among them were H. W. Bates, F. Moore, H. Vaughan, E. W. Robinson, H. Jekel, W. F. Kirby, and others; and entomologists and botanists from other parts of England (of whom F. Bond and J. Boswell Syme may be especially mentioned) were occasionally to be met at his house.

The 'Entomologist's Monthly Magazine' was started in 1864 with a staff of five editors—T. Blackburn, H. G. Knaggs, M.D., R. McLachlan, F.L.S., E. C. Rye, and H. T. Stainton, F.L.S. Black-

burn's name disappeared from the title-page after the second volume ; but no further alteration in the staff occurred till 1874, when Dr. Knaggs found it necessary, owing to the increasing requirements of his profession, to retire from the active pursuit of entomology, and to resign his post as editor of the magazine, although he outlived all the other founders. His most important published entomological work is his 'Lepidopterist's Guide,' which has gone through several editions, and originally appeared in the form of papers in the early volumes of the 'Entomologist's Monthly Magazine.' However, Dr. Knaggs still retained his interest in entomology, and continued to write occasional notes, the last of which appeared as recently as July, 1906. Dr. Knaggs was very fond of Folkestone, where several of his most important captures had been made, and he bought a house there as an occasional seaside residence ; and on retiring from his practice in North London (in which he was succeeded by his son, Dr. H. Valentine Knaggs) he settled there for the remainder of his life. His death supervened on a long and painful illness on January 16th, 1908, and he was buried at Highgate Cemetery on January 20th. His widow, one son, and five daughters survive him. For some years Dr. Knaggs was a Fellow of the Linnean as well as the Entomological Society, but he had retired from both before his death.

W. F. KIRBY.

NICHOLAS FRANK DOBRÉE.

THE death of Mr. N. F. Dobrée, of Beverley, East Yorkshire, occurred on January 8th, 1908, at the age of seventy-seven. A native of Guernsey, and belonging to an ancient and distinguished family, Mr. Dobrée first came to Hull under the charge of Sir William Wright, and about 1850 started in business as a grain and seed merchant, his business offices being situate in the fine old Elizabethan house in High Street, Hull, which was the birthplace of William Wilberforce. There he remained till towards the close of 1906, when "Wilberforce House" was acquired by the Corporation for use as a museum of local antiquities.

Mr. Dobrée travelled largely on the Continent, and was a perfect linguist in German, French, Swedish, and Italian. On these travels he made the acquaintance of many of the leading continental entomologists, including Dr. Staudinger and Herr Louis Graeser. Mr. Dobrée's inclinations had always lain in the direction of natural history pursuits, and about 1871 his attention became directed to the wide field open for observation among the European Noctuæ. With his friend, the late Mr. George Norman, he therefore set about forming such a collection of this group of the lepidopterous fauna as would show the geographical distribution of the various forms. This he continued for many years, and the collection he formed became generally recognized as the best private collection of Noctuæ in this country.

As a keen student Mr. Dobrée gained a correspondingly wide knowledge of the group, and he was a frequent contributor to the pages of this Journal between the years 1875 and 1893, his most

valuable papers being those on "Melanism" and on "*Agrotis fennica*," appearing in two of the issues for 1887. These were epoch-making contributions, and Mr. J. W. Tutt, in his papers on Melanism published a few years later, spoke eulogistically of their author as "our greatest authority on continental Noctuæ."

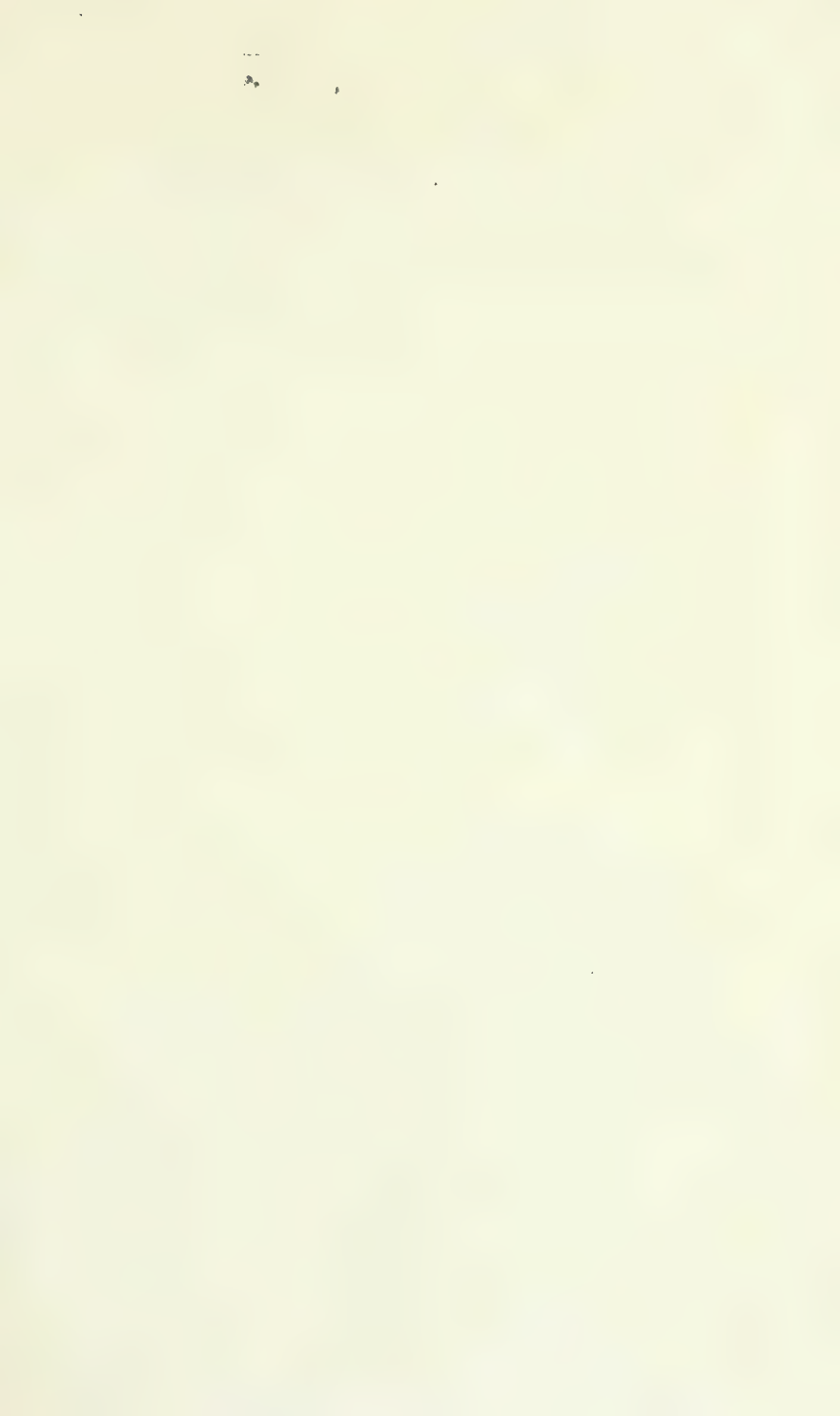
Mr. Dobrée also contributed largely to the local records published in the 'Naturalist' from 1881 to 1901, and was President of the Hull Field Naturalists' Society during the years 1884-86.

In 1904 Mr. Dobrée presented his collection of European Noctuæ to the Hull Museum. It consists of nearly one thousand geographical forms, and of more than six hundred examples of preserved larvæ. In the preservation of larvæ Mr. Dobrée was a pioneer, and by his universal kindness helped many other students to take an interest in this branch of knowledge. His collection has for some months been undergoing the process of cataloguing, and a fully descriptive catalogue will shortly be issued by the Museums Committee of the Hull Corporation, thus rendering the unique collection more widely known and more useful—it is hoped—to students in other parts of the country, as well as to those living in the remote corner of Holderness.

H. B. B.

ARTHUR JOHN CHITTY, who died on January 6th last, aged forty-eight years, was a barrister with a large practice as a company lawyer. During his University career at Oxford he on several occasions kept wicket for the University eleven, and played in the Association football team; he also rowed for his college eight, but failed to get in the trial eights. He obtained a first class in Classical Moderations and a second class in the Final School of Litteræ Humaniores. His entomological interest was chiefly centred in the Coleoptera, in the investigation of the habits of which he was especially successful. Other orders also received his attention, and recently he had commenced to study the Proctotrypidæ, a family of parasitic Hymenoptera, including some of the smallest winged insects. He was elected a Fellow of the Entomological Society of London in 1891, and had served on the Council since 1906. He was also a member of the Entomological Club, into which he was elected in 1904.

HENRY ALFRED AULD died on December 28th, 1907, at the age of fifty-three. He was for many years in the Bank of England. As a collector of Lepidoptera he was most persevering, and never spared himself any trouble in endeavouring to attain his object. Unfortunately he did not consider his field observations of sufficient interest to place on record, and consequently he rarely contributed anything to entomological literature. He was a member of the South London Entomological Society from 1888 to 1897.





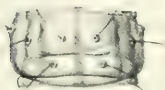
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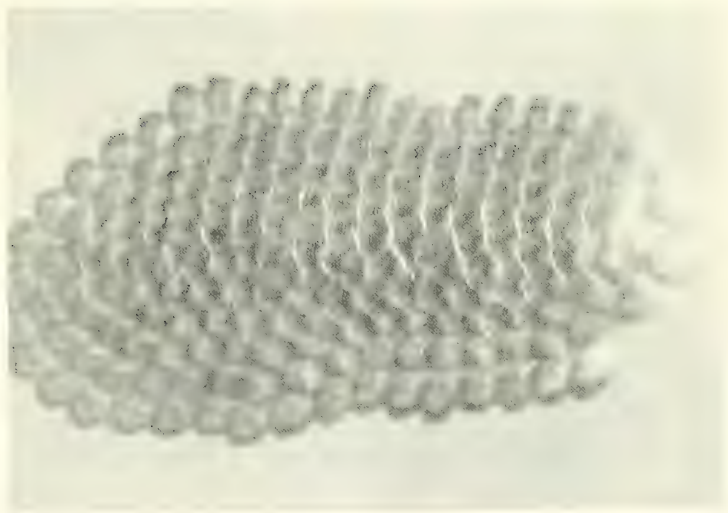
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LIFE-HISTORY OF TORTRIX PRONUBANA.

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EDITORIAL.

WE have very great pleasure in stating that Mr. HENRY ROWLAND-BROWN has most kindly consented to join the Reference Committee of this Journal. His interest in the 'Entomologist' has been shown in the past by frequent contributions to its pages, and in various other ways he has been exceedingly helpful to us. We feel assured that the able assistance he will give in the future, particularly in connection with European Rhopalocera, of which he has special knowledge, will be as highly appreciated by our readers as by ourselves.

LIFE-HISTORY OF *TORTRIX PRONUBANA*.

BY ROBERT ADKIN, F.E.S.

(PLATE II.)

FROM larvæ collected at Eastbourne during the last week in May two male and one female imagines of *Tortrix pronubana* were reared on the morning of June 28th. During the whole of that day they remained quiescent, probably on account of their being effectually screened from any little sunshine there may have been. In the evening one of the males was placed with the female on a freshly cut sprig of *Euonymus* enclosed in a glass cylinder, which was placed where it would receive the early morning sunshine. On looking at them later in the evening the moths were still resting apart, just in the positions where they had been placed; but on visiting them between seven and eight o'clock on the following morning they were found to be paired, and the female deposited ova the same evening.

The eggs are laid in batches after the usual *Tortrix* manner,

one row overlapping another, very like the scales of a fish. They are deposited on the upper side of the leaves of the food-plant, and when quite fresh are brilliant green in colour, but gradually change to a dull greenish yellow, and finally to a dark purplish grey just before hatching, this last change in colour being caused by the black heads and dull yellowish bodies of the fully formed larvæ being seen through the parchment-like skins of the eggs. The larva within the egg is curled up horseshoe-wise, and when ready to come forth it repeatedly opens and shuts its mouth, pressing it the while against the egg-skin until it is pierced; it then seizes the fractured skin in its jaws and tears the hole large enough to admit of its head being forced through, and its escape is thus permitted.

On July 19th the first laid batch of eggs, being evidently on the point of hatching, was placed on a growing plant of *Euonymus japonicus* that had been potted up for the purpose, and an inspection later in the day showed that the larvæ had come forth and had disappeared; no trace of them whatever could be found. On the following day two other batches of eggs that had assumed the final colour were put into a breeding-cage on cut shoots of the food-plant, but with little better success, as when next looked at, young larvæ were seen to be swarming through even the smallest crevices and running away at a great pace, and the majority of this lot also was lost. Evidently the newly-hatched larvæ had a roaming instinct that had to be reckoned with. Only two very small batches of the eggs were now left, and these were put into a glass cylinder with freshly cut shoots of *Euonymus*, and so secured that escape was impossible; and within a few days it was found that the larvæ had emerged from the eggs, and settled themselves between the leaves to feed.

The larva on leaving the egg measures just under 2 mm. in length, is dirty yellow in colour, with numerous stiff whitish hairs disposed over its body, and has a shining jet-black head. It is exceedingly active, travelling rapidly, and for a long distance before settling down to feed. This wandering propensity, which I assume is common to the majority of the Tortrices, appears to be a necessary habit. The eggs are laid in masses, but the larvæ are solitary feeders, more than one seldom being found on the same shoot of the food-plant. A rapid dispersal over a considerable area, in order that they may find suitable positions in which to commence their isolated existence, is therefore essential to their well being, and this, the power they possess of rapid and sustained movement immediately after leaving the egg, enables them to effect. So soon as a larva finds a suitable position, such as two leaves in close proximity, it spins a few threads of silk between them, thus securing itself, and commences to feed. One of the larvæ that I had in the glass cylinder very obligingly fixed itself up between the back of a leaf of the

food-plant and the glass, and was thus under observation during the first two or three weeks of its existence; it fed upon the fleshy part of the back of the leaf, but did not penetrate to the front. The first moult took place on August 7th, when the larva became a yellowish-green colour, the head assumed a browner appearance, and the length had increased to $4\frac{1}{2}$ mm. By the 18th it had moulted again, measured 7 mm. in length, and had become pale green in colour, the head still maintaining the brownish appearance.

Soon after this it became necessary to change the food, and as the larvæ all spun themselves in between leaves it was impossible to keep so close a watch upon them as formerly, but on turning them out some two to three weeks later it was found that they varied very considerably both in size and colour, some two or three being in their last skins, while a larger number appeared to be about half-grown, and the chief difference noticeable in them since their second moult was that the colour of their bodies had become a more decided green.

The full-fed larva measures 15 mm. to 20 mm. in length. The head is smaller than the second segment, glabrous, horn-colour, and has two or more dark brown or black patches at its base, and sundry dark brown or black markings about the mouth-parts; the intensity and number of these dark markings varying in individuals. The thoracic plate is glabrous green, with four (more or less) blackish-brown, irregularly angulated patches along its posterior margin. The body tapers towards each end, is olive-green on the back to the lateral skin-fold, which, as well as the ventral surface, is paler; the anal segment also is paler. On the back of each segment are four slightly raised paler tubercles and below them on each side another, each emitting a stiff whitish bristle, and on the skin-fold is yet another, from which two bristles spring, the whole giving the larva a somewhat hairy appearance.

The first moth emerged on September 18th, and was followed by others at somewhat lengthy intervals until December 13th, this last having been in pupa for some five or six weeks, during the latter part of which it was kept in a cool greenhouse to protect it from any actual frost. The remainder of the larvæ are hibernating (?), approximately full-fed, and as those from the September-October moths pass the winter quite small, there appears to be good reason for supposing that the imagines are on the wing throughout the summer and autumn months.

EXPLANATION OF PLATE II.—1. *Tortrix pronubana*, ♂. 2. Ditto, ♀. 3. Larva, dorsal view, slightly enlarged. 4. Larva, lateral view, slightly enlarged. 5. Segment of larva, enlarged, dorsal view. 6. Enlarged sectional view of larva. 7. Mass of ova $\times 100$.

SUPPLEMENTAL NOTES ON *EUPITHECIA*.

BY LOUIS B. PROUT, F.E.S.

I do not propose, on the present occasion, to enter upon a discussion of any fresh questions, but merely to make some additions which have been placed at my disposal by some kind correspondents, at the same time thanking all those who have been good enough to intimate their appreciation of my previous articles (Entom. xl. 169, 206, 220), and expressing anew the hope that an increasing number of workers will devote themselves to the study of the genus.

I exceedingly regret that two inexcusable blunders found their way into my introduction, which was prepared in a somewhat more hasty and perfunctory way than the rest of the notes, the fact being that I was rather tired of the warfare against "*Tephroclystia*," yet felt that I must not miss so good an opportunity for a final onslaught. Of course, on p. 169, second paragraph, I ought to have written *Tephroclystia*, not *Tephroclystis*, the former being Hübner's spelling, the latter Meyrick's (copied by Hulst), and due merely to an inadvertence, probably originating in the instinct to make the name "homœoteleutan" with *Chloroclystis*, Hb. In the same paragraph I wrote, by a *lapsus memoriæ*, "*Eupithecia* (with type *linariata*)"; whereas, as I perfectly well knew, Curtis chose *absinthiata*, Cl., as the type of his genus, though he figured, and drew his structural details from, *linariata*. The eagle eye of my valued friend and co-worker, Rev. G. W. Taylor, at once detected these errors, he having had correspondence with me earlier on the self-same points.

Regarding the *Phyteuma* larvæ of *Eupithecia denotata* = *campanulata*, mentioned on p. 209 (middle paragraphs), Dr. Draudt writes me that the imagines obtained from them show no difference from other *denotata* bred from *Campanula*.

I learn from Mr. Eustace R. Bankes that he has already interested himself in the curious record of *E. fraxinata* larvæ on "scabious" at Hartlepool (*vide* p. 208), and he has kindly given me free permission to use the correspondence which he had with Messrs. Robson and Gardner on the subject. Barrett's record, as Mr. Bankes points out, is based on a fuller one in Robson's "Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne" (Nat. Hist. Trans. North., Durh., x. 1902), which reads as follows (p. 267):—

"In August, 1899, I took some 'pug' larvæ on the sand-banks between Black Hall Rocks and Castle Eden, which produced three melanic imagines, for which the same name" [*innotata*] "is suggested. I made no notes of the larva, thinking them some common species, and writing now from memory I

think they more resembled *fraxinata* than *innotata*. They were feeding on scabious, and I do not remember any *Artemisia* near, but certainly there was no ash. Up to the present time I believe *innotata* has only been found on *Artemisia*. Mr. Gardner says, 'I find all the "pugs" I have bred will feed upon the flowers of plants, particularly of scabious and *Centaurea*.' " On inquiry, Mr. Bankes learned that there was much that was hazy concerning this record. In the first place, Mr. Robson acknowledged (*in litt.*, 20th April, 1904) that the plant referred to as a "scabious" seemed to be really a knapweed, probably *Centaurea nigra*, his botanical knowledge having "rusted for some forty years"; Mr. Gardner, on the contrary, who was with Mr. Robson when the larvæ were taken, asserts positively (*in litt.*, 13th June, 1904) that they were found "*on various plants*." Further, there was a discrepancy as to the exact number found, each being "fully persuaded in his own mind"; the exact details, as furnished by each, are not relevant to the present question. Both, however, were in the main agreed that the larvæ agreed rather with Buckler's figures of *E. fraxinata* than of *E. innotata*; for Mr. Gardner wrote much more definitely than Mr. Robson, his words being: "I can assure you that the larvæ we got were the gaily coloured larvæ of *fraxinata*, and not that of the miserable-looking example figured for *innotata*." But I have shown (*Entom.* xl. 206-8; *Ent. Rec.* xvi. 336*) that *E. innotata* is far more variable in markings and habits (even apart from the *fraxinata* race) than Mr. Gardner was aware, and this of course weakens his evidence. Mr. Bankes, who very carefully examined the disputed specimens, inclined to call them *innotata*, but he confesses that (like all the rest of us!) he "cannot separate the moths with any certainty."

The above shows that no such definiteness exists about the "scabious" record for "*fraxinata*" as I assumed when I wrote; but I fear it proves little or nothing else. I hope our northern friends will work their coasts thoroughly and systematically for "pug" larvæ, and clear up some of our dark places.

As to the "*E. tamarisciata*" (?) bred by Mr. E. M. Holmes, F.L.S., from North Cornwall (*Ent. Rec.* xviii. 158), Mr. Holmes tells me he was unaware that Mr. Tutt intended to publish a reference to it, and it was perhaps a little premature, as Mr. Tutt had not seen the larvæ, and evidently only determined the species by the food-plant. Mr. Holmes has very kindly submitted his material to my inspection, but as he will no doubt write upon it when further elucidation has been obtainable, I shall not forestall him further than to say that I quite agree with him that his larvæ did *not* tally with the only definitely

* "Mr. J. Gardner," in this latter reference, is a printer's or editor's error for "Mr. J. E. Gardner," and refers to Mr. Gardner, of Clapton, not to Mr. Gardner, of Hartlepool.

known form of *tamarisciata*, but much rather with *fraxinata*, and that for the present I would not venture to locate the imagines; of course they belong to this *group* (or *species*, if Staudinger is right).

Regarding the question of food-plants and larval habits of the "pugs," I have had further interesting notes from Mr. Percy C. Reid. He has discovered that in his district hawthorn—which I gave as a quite exceptional food-plant for the species (Entom. xl. 322)—is regularly favoured by the larvæ of *Chloroclystis coronata*, and that in both broods. Mr. Reid has made a partial reference to this in some recent notes on the season 1907 (Ent. Rec. xx. 13), but I think it worth while to quote from a letter which he sent me while my former papers were in the press. He writes (*in litt.*, 27th July, 1907): "In May last I bred some specimens of this insect" [*C. coronata*] "in a cage containing a number of pupæ, beaten as larvæ from hawthorn in the preceding August. As hawthorn is not mentioned as a food-plant in any work of reference in my possession, I concluded that by some accident these *coronata* had found their way as larvæ or pupæ into this cage, and thought no more of it. But in June last (on the 21st, I think*) I beat a number of Eupitheciid larvæ from hawthorn, and wondering what they could be I made a note of the fact. Now they are beginning to emerge as *E. coronata*." To this should be added—from the article in the 'Entomologists' Record' already alluded to—that these were succeeded by a further brood of larvæ at the end of August on bramble, one of which produced the imago on September 29th, a member of the very partial third brood which this species occasionally throws. I can also amplify, from the information he has supplied me in correspondence, Mr. Reid's note on the occurrence on *Pastinaca* of the larvæ of *Eupithecia pimpinellata* and *trisiinaria*. He writes (*in litt.*, 21st September, 1907): "It does not do to generalise from one observation, but I noticed that the *pimpinellata* occurred on the smaller and more scattered plants on the open down, while the *trisiinaria* were on the larger and more rampant plants along the edges of and just inside a copse.

I had hoped, ere now, to be in a position to say something about the differentiation, or otherwise, of *Eupithecia innotata* and *fraxinata* by the genitalia, but the illness of my friend Mr. Pierce has hindered work in this direction, and if any definite result be arrived at, it must be published in a separate note.

* Mr. Reid has now fixed the exact date as June 20th.

A FEW NOTES FROM BÉRISAL DURING JUNE, 1907.

BY R. M. PRIDEAUX.

HAVING read Mr. Rowland-Brown's recent interesting article (Entom. vol. xl. pp. 241-248), it occurred to me that a few observations from the same district, made prior to his sojourn there, may be worth jotting down.

Mr. G. C. Griffiths and myself, after a short experience in the Lower Rhone Valley, arrived at Bérissal for an eleven days' stay on June 13th last. As elsewhere, the season was a decidedly backward one, and far too early at this period for the more essentially alpine species to put in an appearance. Nevertheless, we did not do badly, being able to secure many species freshly emerged, and also to find a considerable number of interesting larvæ and pupæ from the rocks and stones, &c., in the neighbourhood, a fair proportion of which were subsequently reared to maturity at home.

Mr. Rowland-Brown's tragic account of the condition of the locality for *Rusticus zephyrus* var. *lycidas* above Refuge II. emphasizes our good fortune in having had an earlier experience of it. Normally, it would appear that this species might first be looked for at the end of May, judging from its abundance this year by June 15th, on which date even a few slightly ragged specimens were to be seen. No doubt a very prolonged period of emergence enables this species to hold its own in a much hackneyed locality. Having on previous occasions obtained specimens of *R. lycidas*, I was content with boxing a few perfect ones. They are best obtained, in my opinion, on a dull, windless day, or towards sundown, by scanning the grassy downs and slopes where the food-plant occurs, when they may readily be discovered at rest. The females lay pretty freely in captivity on *Astragalus exocarpus*, but it is difficult to obtain a satisfactory root of this plant for transplantation, and a trial of the young larvæ on various other Leguminosæ, and also on *Erica* and *Calluna*, proved a failure. I possess one male of this species which exhibits a few of the silvery-blue scales on the eye-spots of the under side hind wings placed where they normally occur in the type *R. zephyrus*, also in *R. argus* and *R. argyrognomon*.

The latter two "blues," though later abounding in company with *lycidas*, had not emerged on June 15th, nor were seen there until several days later. *Polyommatus escheri* did not turn up until the 18th, when the males began to appear in superb condition. A pleasant surprise was the sight of *P. baton* between the Ganter Bridge and Refuge II., several specimens in fair condition turning up on and after the 17th. Another unexpectedly early visitor was a male *P. cros*, attracted by a puddle close to the Ganter Bridge, on the 18th, but not subsequently

seen again. Single specimens of *Lycæna arion* var. *obscura* were obtainable in rare perfection on and after June 18th. *Polyommatus hylas* first appeared in this district on June 21st (males only), though commonly met with at lower elevations—near Montreux, &c.—earlier in the month. The following additional “blues” were all more or less abundant round Bérissal during our stay:—*P. alexis*, *P. bellargus*, *P. astrarche* (with one ab. *allous*), *P. eumedon*, *Cupido minima* and *Nomiades semiargus*.

It was a pleasure to record the first male *Chrysophanus alciphron* var. *gordius* on June 20th. A small race of this species was abundant just below Bérissal in July last year, but specimens reared therefrom and emerging this season are but little below the average size of specimens taken near Vernayaz in 1905. The species hibernates invariably as a larva, never as an ovum, in my experience, and when once the young larvæ can be induced to recommence feeding in the spring there is little difficulty in bringing them to maturity.

Parnassius apollo was fairly common by June 17th about the road and cliffs towards Refuge II., and Mr. Griffiths and myself were both fortunate in finding one or two full-grown larvæ of the species. My own, taken on the bare ground on June 20th, spun up at once, and produced a male butterfly on August 11th. *P. mnemosyne* was already out on the steep slopes below the hotel on June 17th, and on every subsequent day in increasing numbers; also in the Steinenthal on June 20th. On this day, too, the first *Colias phicomone* were met with—three specimens—and Mr. Griffiths also obtained one much lower down, near Refuge II. *C. palæno* was neither expected nor seen up to the time of our leaving; *C. hyale* was generally common.

Papilio machaon was common from June 16th, especially round Refuge II. On the next day it was tantalizing to find three (presumably plum- or sloe-fed) *P. podalirius* feeding in puddles near the Ganter Bridge, while the writer found it needful to plod his way down to one of the outlying settlements near Brigue to obtain the plum-leaves required by a brood of *Zephyrus betulæ* larvæ previously obtained near Glion. On this same day *Aporia crategi* was flying, larvæ and pupæ of which were abundant on the mountain-ash trees round the hotel. *Leptosia sinapis* and *Euchloë cardamines* were common, with *Pieris napi* var. *bryoniæ* (females) in very fine condition. On June 15th, in one spot just above Bérissal, *Anthocharis simplonia* was so abundant that about twenty specimens were netted in as many minutes, and it continued common but far less local and easily obtainable during the remainder of our visit.

June 16th, a superb brilliant day, spent on the beautiful stretches of road up to the Hospice, convinced us that our better ground for the time being lay below rather than above Bérissal. Nevertheless, a fair number and variety of larvæ and pupæ from

the stones and rocks prevented the day from being (even entomologically) wasted.

Of the Argynnids, only *Brenthis euphrosyne* was abundant; one pupa, found on June 16th, produced a butterfly in ten days. Mr. Griffiths also found a pupa of *B. amathusia*. *Issoria lathonia* was pretty common near Refuge II., but not in very good condition. Among the Melitæids, *M. phæbe* was found in abundance as a larva and pupa, the first imago appearing on June 17th, and a female being bred in captivity as late as August 22nd. The cold summer in England seemed to have a very retarding effect on these and other larvæ, they ceasing altogether to feed during dull chilly weather, and always exposing themselves on their thistle-tops to such sunshine as was to be had. The commonest pupa of the genus above and below Bérissal was *M. dictynna*, the butterflies emerging in the following July. The pupæ hang, regardless of aspect, on perpendicular rocks and stones, frequently on such as afford no very obvious projection or irregularity for convenience of pupation. Many developed parasites, and some freshly turned examples were found being devoured by large ants. The butterfly was scarcely out before our departure on June 22nd, but I believe Mr. Griffiths secured one specimen. *M. parthenie* var. *varia*, also *M. athalia*, were met with, and *M. cinxia* had been out some time, judging from its condition. A few *M. aurelia* were taken near the Ganter Bridge, and a specimen bred from a stone-hung pupa on July 26th. Males of *M. didyma* were out in superb condition by June 18th, soon becoming commoner, and females were taken half-way down to Brigue on 17th and 22nd. One pupa was found which yielded a male imago on July 19th.

Rarely has one the pleasure of recording seven species of Vanessidæ on a single occasion, but on June 19th *Aglaia urticæ* (fine and fresh), one *Eugonia polychloros* (also fresh), and hybernated examples of *Pyrameis atalanta* and *cardui*, *Euvanessa antiopa*, *Vanessa io*, and *Polygonia c-album* were all to be seen between Bérissal and Refuge II.

Species of the genus *Erebia* naturally were not out in full force during our stay. *E. evias* was, however, abundant both above and below Bérissal, *E. ceto* began to appear on June 18th, and Mr. Griffiths netted the first *E. tyndarus* in the Ganterthal on the same day. *Pararge hiera* was abundant, especially above Bérissal, and *P. mæra* began to appear below on June 18th. A few larvæ were found on grass, and pupæ suspended from stones, of this species. *Cænonympha arcania* var. *darwiniana* was recorded first on June 19th.

The "skippers" were represented by *Hesperia carthami*, *H. alveus*, *H. serratulæ*, *H. malvæ* and *H. sao*, *Nisoniades tages*, and *Pamphila sylvanus*.

Several species of Noctuæ and Geometræ were found at rest

on the rocks, many of which still require naming. Amongst the latter were hybernated specimens of *Cidaria miata* and *Scotosia certata*; I netted a *Cymatophora duplaris*, and a specimen of *Chærocampa porcellus* was also taken at rest.

The above notes will, I think, show that an earlier visit than is customarily paid to this beautiful region by entomologists is by no means profitless; special points being the superb condition of most of such imagines as were recorded, and also the abundance of larval and pupal life, the list of which, had our weather proved less favourable for net-work, could no doubt have been largely extended.

Brasted Chart, near Sevenoaks: December, 1907.

ON THE INTERESTING NATURE OF HETEROPTEROUS METAMORPHOSES.

By G. W. KIRKALDY.

THE statement in most entomological text-books that the Hemiptera undergo only a very slight metamorphosis throughout their postembryonic life, has probably led to the almost total neglect of this fascinating branch of entomology.

In a broad sense, as indicating their homomorphous nature, this is true, but as regarding actual details, it is very misleading. From ovum to adult many of the Hemiptera undergo very remarkable changes of form, much more interesting in reality than the ecdyses of Lepidoptera or other Heteromorpha; for while these latter have three well-marked post-oval stages, in the Hemiptera there is, as a rule, the gradual evolution of a single form.

Entomologists will open up almost virgin soil in a fascinating field who will rear up Hemiptera through all their stages, describe and draw these, record their food-plants and habits, &c. In the October number I briefly alluded to the Homoptera; now I offer a few words on the Heteroptera.

The Cimicidæ (= Pentatomidæ) are especially worthy of study. The eggs are among the most remarkable in form, sculpture, &c., of any insects, and are known in less than a dozen species all over the world.

De Geer ('Memoires,' vol. iii. pls. 13 and 14), 1773, has roughly figured some of the stages in *Dolycoris baccarum* (or *Cimex verbasci*, as he calls it). The eggs are laid on the flower-heads of avens, *Geum urbanum* (pl. 13, fs. 19-22, &c.). They are oval, with a little lid. The first nymphal instar has a short rounded head, forming almost one curve with the pronotum at the sides (pl. 14, fs. 1-2), but in a later stage the anterior

margin of the pronotum is straight and very wide, the head narrow (figs. 3-4).

Elasmucha grisea (= *Acanthosoma interstinctum*, Saunders = *Cimex betulae* De Geer) is celebrated for its parental affection (cf. 'Entomologist,' 1903, p. 114). An early nymphal instar has a remarkably produced head, the central lobe being twice as long as the lateral ones. The species of *Eurydema* (*Strachia*) have strongly coloured, cylindric eggs, with truncate ends.

The nymphs of Tingidæ are usually curiously spined, while those of many Reduviids are sticky and so become covered with dust, pollen, cast skins of their prey, &c. The eggs of Reduviids are deposited, like those of Cimicids, on the surfaces of leaves, and have ornamented caps of noteworthy form. The eggs of Nabidæ are inserted in plant-tissue, almost to their very end.

Among specially interesting British Heteroptera, of which the life-histories are only partially, or not at all, known, I would suggest: *Eysarcoris fabricii* (= *melanocephalus*) on *Stachys sylvatica*; *Rhytidolomia* (= *Pentatoma*) *juniperina* on *Juniperus communis*; *Eurydema oleracea* on Cruciferæ; *Elasmucha grisea* on *Betula alba*; and *Monanthia cardui* on *Carduus crispus*. These five are all common, at least locally, and should be easy to observe and rear up. I may perhaps be allowed to refer to two of my own papers which may be of interest in this connection, viz.:—"Upon Maternal Solicitude in Hemiptera, &c." Entom. 1903, pp. 113-20. "Biological Notes on the Hemiptera of the Hawaiian Isles. No. 1." P. Haw. E. S. i. 135-61; 4 text figs.

My friend Mr. de la Torre Bueno has recently described the stages of several waterbugs very fully in the 'Canadian Entomologist.'

NEW AMERICAN BEES.—VI.

By T. D. A. COCKERELL.

Osmia copelandica, sp. nov.

♀. Length 7 mm.; black, with a very faint brassy tint on the front, and the abdomen with an obscure purplish lustre, and the hind margins of the segments very narrowly ferruginous; *ventral scopa pure white*; conspicuous white hair at sides of face, sides of metathorax, and to a less degree about tubercles; first and second abdominal segments with conspicuous white marginal hair-bands, on the sides only; hair on inner side of hind tarsi white tinged with golden; head and thorax densely punctured; head large, cheeks broad; flagellum faintly reddish beneath; mandibles tridentate; clypeus prominent, rather produced, the lower margin gently concave; tegulae dark reddish; wings a little infuscated; abdomen shining, finely punctured; spurs yellowish-ferruginous, not dark; pulvillus large. A very distinct species, apparently related to the European *O. adunca* (Panzer), but much smaller.

Hab. Copeland Park, Boulder County, Colorado. Sept. 4th, 1907 (S. A. Rohwer).

Epeolus hitei, sp. nov.

♀. Length $7\frac{1}{4}$ mm.; black, with the usual markings; head and thorax densely rugoso-punctate; head broad, eyes strongly converging below; labrum, mandibles, and first three antennal joints ferruginous; tegulæ, tubercles, tibiæ, tarsi and femora at apex and narrowly beneath, all lively ferruginous; anterior middle of mesothorax with a rather V-shaped mark of light pubescence; scutellum bigibbous, extending beyond the short lateral teeth; pleura with a very broad and conspicuous transverse band of light hair, below which it is nude or almost, very densely rugoso-punctate; spurs reddish-white; wings with a distinct dusky shade beyond the marginal cell; stigma ferruginous; abdomen with broad yellowish-white hair-bands; first segment with a long transverse dark area, and the marginal band interrupted in the middle. In Robertson's table (Canad. Entom. October, 1903) this runs to the neighbourhood of *E. autumnalis* Rob., but is very distinct from that by the markings of the thorax, larger punctures of scutellum, &c. The resemblance is closer to *E. beulahensis*, Ckll., but the thorax is much less hairy than in that species, and the lateral oval spots on second abdominal segment are wholly wanting, while the dark area on the first is not pure black, but is covered with fine golden-brown pubescence.

Hab. Copeland Park, Boulder County, Colorado. September 6th, 1907 (G. M. Hite).

Sphecodes lautipennis, sp. nov.

♂. Length 8 to 9 mm.; black, with the abdomen red except at base and apex; face covered with white hair; vertex with erect white hair; mandibles with the apical three-fifths ferruginous; antennæ black, flagellum thick, submoniliform; thorax with white hair, the mesothorax quite hairy, and with strong close punctures, the posterior middle shining and with the punctures widely separated; middle of scutellum flattened, shining and sparsely punctured; area of metathorax sharp-edged, and with very strong vermiform plications; legs black, the small joints of tarsi ferruginous; tegulæ testaceous, subhyaline and punctured in front; *wings ample, very clear*, almost milky, nervures very pale ferruginous, stigma more infuscated; abdomen parallel-sided but not especially narrow, shining; first segment very sparsely punctured, second with the apical two-thirds very sparsely punctured, the basal with fine close punctures; third with the fine punctures extending practically to the subapical groove; fifth and sixth segments, except apical margin of fifth, black, and a little blackish on the one before; black on first segment occupying the basal part, except a more or less evident median red patch, the hind margin of this black having two small projections. Fourth antennal joint as long as fifth, and not so long as $2 + 3$; flagellum without facets beneath. Allied to *S. clematidis* Rob.; peculiar for the clear white wings.

Hab. North Four-mile Cañon, Boulder County, Colorado

(type locality). September 3rd, 1907 (S. A. Rohwer) ; Jim Creek, September 7th, 1907 (G. M. Hite).

Ashmeadiella denticulata (Cresson).

The species of Colorado and New Mexico, generally known as *Ashmeadiella buconis* (Say), should apparently be called *denticulata*. The latter has been considered a synonym of *bucconis*, but the ventral scopa of the female is white, whereas it is yellowish in *bucconis*. *A. denticulata* was collected at Boulder, Colorado, August 28th, 1907, by Mr. S. A. Rohwer.

DESCRIPTIONS OF TWO NEW SPECIES OF CHRYSIDIDÆ FROM BORNEO.

By P. CAMERON.

Hedychrum borneanum, sp. nov.

Green, with brassy tints, the centre of mesonotum blue, ocellar region and the apical segment of abdomen tinged with purple; antennal scape and pedicle green, the flagellum black; wings hyaline, tinged with violaceous, the nervures black; tarsi rufo-testaceous. ♀. Length, 6 mm.

Kuching, Borneo (John Hewitt).

Vertex with fine widely, irregularly separated punctures; the front with much larger punctures, more closely pressed, below, laterally, almost forming reticulations; the space below the antennæ smooth. Mandibles green, brownish at the apex. Outer orbits for the greater part finely, closely, longitudinally striated. Pronotum smooth, impunctate, as is also the mesonotum, except for a row of large deep punctures along the outer edge. Scutellum smooth, with two large round punctures on the outer edge. Basal part of metanotum covered with large round deep punctures; the apical slope with an area in the centre above, transverse above, the apex obliquely narrowed to a point below. Propleuræ strongly punctured above, smooth below, the smooth part dilated upwards at the base. Mesopleuræ with large clearly separated punctures, the lowest of which form a regular longitudinal row; below is a row of six larger squarish foveæ, in a depression, bordered above and below by a keel. In the centre of the metanotum are two large aræ, the basal squarish, the apical smaller and oval. Abdomen smooth and shining, the lower edge white and membranous. As usual, the frontal depression is finely transversely striated.

Chrysis (Heptachrysis) hewittii, sp. nov.

Green; the head, thorax, and basal segment of abdomen with a brassy tint; the ocellar region, the basal half of middle lobe of mesonotum, and the base of second abdominal segment narrowly, indigo-blue. Antennal scape and the basal two joints of flagellum dark

green, the rest of flagellum black. Legs green, the coxæ and four anterior femora behind brassy, the tarsi black. Wings hyaline, slightly suffused with violaceous, the nervures black. ♀. Length, 7-8 mm.

Kuching, Borneo (John Hewitt).

Front and vertex above the keel closely covered with round punctures, with sharp borders; immediately below the keel is a raised border of similar punctures; the depressed part below the latter is closely, somewhat obliquely striated, there being a narrow, shallow furrow down the centre. Outer edges of face punctured. Apex of clypeus smooth, broadly rounded. Mandibles dark purple, the extreme base green, followed by a brassy band. Thorax closely covered with round deep punctures, those on the pronotum finer, those on the metanotum coarser than those on the mesonotum. There is a smooth depression in the centre of propleuræ, bordered below by a broad roundly curved margin. Metapleuræ smooth above, below irregularly, finely striated. The lateral angles of metanotum project into stout triangular teeth. The scutellum is bordered laterally by a wide furrow. The first abdominal segment is more strongly and more widely punctured than the second and third. The four teeth on the latter are wide and short; it is more finely and closely punctured than the second: there are four foveæ on either side; they are deep and longer than wide; outside the outer tooth are two smaller and more indistinct foveæ or depressions. There is a fine but distinct narrow keel down the centre of the ventral surface.

NOTES AND OBSERVATIONS.

PIERIS BRASSICÆ LARVÆ IN JANUARY.—On reading Mr. Frohawk's note (*antea*, p. 39), I thought the following note from my diary would be interesting to your readers:—"Very mild winter; found several larvæ of *Pieris brassicæ* in my garden, January 10th, 1884."—W. E. BUTLER; Hayling House, Oxford Road, Reading, February 13th, 1908.

WINTER BROOD OF DASYCHIRA PUDIBUNDA.—It may possibly interest some readers to know that I have had a winter brood of *D. pudibunda* out in one of my breeding-cages. They were not "forced" in any way beyond being kept indoors in a cold greenhouse. The larvæ spun up in August last, and the first imago (a female) appeared on September 29th, then four females in October, eleven females and six males in November, two females and six males in December, and two males in January, 1908. The last came out on January 17th.—J. J. JACOBS; St. Clair House, Gillingham, Kent, Feb. 8th, 1908.

NOTE ON THE LARVA OF ACIDALIA OSSEATA.—I am writing to you in reference to larvæ of *Acidalia osseata*. I find that they will eat the moss *Hylocomium triquetrum*. I took a female last August, which laid a few ova; these hatched in about three weeks, and the larvæ fed on knotgrass. They continued to feed until the end of

September, when they started to hibernate, and were put into a metal box with dried moss of the species mentioned above. I did not look at them again until mid-January, 1908, when I found that they had grown very considerably. I should be interested to know if any other readers of the 'Entomologist' have had any similar experiences.—F. POPE; 11, Portland Street, Newtown, Exeter.

CAPTURES AND FIELD REPORTS.

CARADRINA AMBIGUA IN DEVONSHIRE.—Last year I took five specimens of this species, and Mr. Blanchford captured three others.—F. POPE; 11, Portland Street, Newtown, Exeter.

NOTES FROM THE NORTH-WEST.—The year 1907 will probably be remembered for some time by collectors in the British Isles, and indeed in Southern and Western Europe, as a year with a bad general character. Gloom, rain, wind, and cold were too often the temper of the sullen year. On January 23rd the whole of Europe was in an icy grip, and the rare spectacle of snow was witnessed in Naples and Athens. February was little less severe than January, and it was March 16th before a friend and I could pay our first visit of the season to Delamere Forest. Nothing entomological rewarded us except six *Phigalia pilosaria*, and a solitary *Hybernia leucophæaria*, taken at rest on tree trunks. Two *pilosaria*, the same number of *leucophæaria*, three *H. progemmaria* (one a var. *fuscata*), a couple of *Anisopteryx æscularia*, one *Larentia multistrigaria* and a *Tortricodes hyemana* were the list for another day (the 23rd) in the same locality. In fact, Delamere Forest seems to be not worth working for imagines now until the end of April.

It was interesting to note that our March captures had not got rid of the cyanide until the third day after killing, a difference of, say, two days after geometers were relaxed and fit to set when killed in June—that is, geometers killed in June are, as a rule, relaxed and fit to set the day after death by cyanide. The cyanogen naturally escapes quicker in a warm than in a cold temperature.

In solemn state the Holy Week went by, And Easter Sunday gleamed upon the sky. And it was positively fine, sunny, dry and warm. On April 1st (Easter Monday) I saw my first butterfly of the season—a *Pieris rapæ*, fresh from the chrysalis. Next day my eyes were gladdened by a *Vanessa urticæ*, hibernated of course, busily seeking for nettles whereon to lay its eggs—and then came a frost, "a chilling frost," and it was months before we had another really fine day (July 5th). In fact, the April of 1907 was one of the three wettest for forty-one years—the sunshine was five hours short of the average, and the temperature was exceedingly fickle.

May came in with snow in Westmorland, on the Pennine Chain, in Shropshire and North Devon. On the 8th Mr. J. Thompson, of Chester, and I went to the Wallasey sandhills. We were too late for *Nyssia zonaria*, and too early for *Eubolia lineolata*; but we got two batches of *Taniocanpa opima* eggs by searching dead plants, twenty-

one hibernated larvæ of *Lasiocampa quercus* (? var. *callunæ*) and three hibernated larvæ of *Arctia caia*.

The eggs of *T. opima* hatched a few days after, and the larvæ were full-fed on the 16th of July. In spite of giving them plenty of air and room in large flowerpots nearly filled with soil, and with net over the top and a piece of glass almost covering it to keep the food (sallow) fresh, I lost exactly fifty per cent., chiefly in the last stage, through diarrhœa.

My share of the *L. quercus* larvæ was eleven. They were all nearly full grown, and soon spun up. Five moths (two males and three females) emerged between July 20th and July 26th—the rest (six) are lying over the winter. Mr. South, in his welcome book, 'The Moths of the British Isles,' p. 116, refers to "the outward turn of the lower ends of the yellow bands" in the northern variety *callunæ*. Four of my five moths have this feature strongly marked; a female is referable to the pale southern form (the true *quercus*) and is without this outward turn of the lower ends of the yellow bands; one male possesses the buff-yellow basal patch; and the other male has the right upper wing and the outer third of the right lower wing coloured as in the female. The left upper wing has also a costal suffusion of this feminine tint.

On the 15th of May half a dozen Chester pupæ of *Spilosoma menthastri* I had kept out of doors through the winter began to turn out imagos. Two of the latter are worth special notice as follows:—No. 1. Upper wings buff—a broad, uniform streak of white from the base of the wing to very near the outer margin. The streak is situated above the inner margin, and runs parallel to it. The black spots are well developed on the upper wings, and especially large on the lower wings. No. 2. The left lower wing is two-thirds smoky-black from the outer angle inwards towards the base. One or two streaks of this smoky-black appear on the right lower wing. The upper wings are fairly normal, but inclined to buff, and well spotted. A result of the advent of these interesting specimens is that I have a large number of Chester pupæ lying, naturally, through the winter, in the hope that further developments in melanism will show in the species next May.

On May 18th I took off tree trunks nine male and three female *Tephrosia biundularia*, in Delamere Forest. They were all typical specimens of the Delamere dark form. From eggs laid by these females, and resultant pupæ now lying over the winter, I have little doubt about getting two or three, or more, of black examples with the white zigzag line near the wing margins. There can be no question that the species is single-brooded at Delamere.

Throughout May and continued into August I made many excursions among the romantic Denbighshire hills and valleys—sometimes alone and sometimes with pleasant companions, all with Nature hobbies. The only drawback was the unseasonable weather. On May 19th (Whit-Monday) there were cold northern airs, and a cloudy sky occasionally lit up by gleams of weak, wintry sunshine. There were six degrees of frost at Hampton Court, four degrees at Oxford, and it was ten degrees warmer in Iceland than at Folkestone, doubtless through the influence of the Gulf Stream. In fact, we had

December weather. Whit-Monday, however, occurred very early in 1907—a fortnight earlier than in 1906—so some allowance should be made. And if the May visits into Denbighshire were almost entomological blanks, they were worth taking if only to admire the wealth of wild flowers on the hedge banks—primroses in profusion, the reddest of red campions, hyacinths, yellow as well as white dead nettles, violets, wood sorrel, stitchwort, &c. Three *Lycena argiolus* were taken at rest off a holly hedge on the base of Minerva Mountain on the 19th. This butterfly is single-brooded here. Second broods, it is reported, have either failed to occur or have been poorly represented, in 1907, in localities north of Warwickshire, probably owing to the unfavourable season. The butterfly was unusually scarce in Denbighshire. Four males and a couple of females were taken, June 1st. Two of these were found resting on a holly hedge, and the remaining four were beaten out of it. A male and female were netted on the wing, June 8th—all in the same locality—and these were the last seen. It is hardly possible to examine these “blues” without calling to mind Darwin’s theory in his ‘Origin of Species.’ The Creator evidently bequeathed such a liberty of development—new insect colour-forms arising even in a lifetime—that it is possible all the “blues” were evolved from one original type through exterior causes which are lumped together under the head of “environment.” And Charles Kingsley saw nothing in the acceptance of this possibility which militated against the Bible story of creation. (See ‘Life and Letters of Charles Darwin.’)

From Wrexham to Llangollen *Numeria pulveraria* is a common geometer. Here the dark bar on the upper wings is wider than in my series from Kent, and the ground colour in both sexes is paler. In beating the hedges we netted four on the 1st of June, together with *Melanippe fluctuata*, *Coremia unidentaria*, a solitary *Anticlea badiata* (a late specimen, but perfect), and *Eupithecia vulgata*. Flying over the grass were numerous *Emmelesia albulata*, and a typical female *Odontopera bidentata* was discovered resting at the foot of a hedge. *Eubolia palumbaria*, *M. montanata*, and a female *S. mendica* (the latter very rarely met with in the Chester district) were added to the list on the 8th—together with larvæ of *V. urticae* off nettles. One of the *pulveraria* females is a pale buff, almost unicolorous and with faint markings. She laid a few eggs, and the larvæ pupated during August. We found *Acronycta menyanthidis* commonly enough on the heather tops in June. The form here has a pale, bright ground colour, with clearly defined dark markings. One I found at rest on a tree in the lowland—a mile away from the heather—on the 15th, evidently driven off by the previous day’s stormy weather.

About the middle of the month a friend called me into his garden to look at his hollyhocks, the leaves of which were spun together and well riddled by tortrix larvæ. They turned out to be *Tortrix forsterana*. The plants were saved from further mischief by picking off the larvæ, many of which I reared as imagos. At Burton Point, on the Dee estuary, I found larvæ of *Aspis udmanniana* plentiful in spun-together bramble shoots, June 19th.

Midsummer Day (June 24th). In the last forty years the highest temperature has not reached sixty degrees on five occasions—in the years 1871, 1877, 1885, 1894 and 1901. The lowest maximum temperature recorded on Midsummer Day in these years is fifty-five degrees, in 1885. The reading for Midsummer Day, 1907, was fifty-three degrees! The maximum recorded is seventy-eight, in 1887. Altogether, the June of 1907 fully deserved the character of "a doleful June." The skies were generally clouded, and the weather cold and wet. Snow fell in Scotland, in Westmorland, and North Yorkshire on the 25th. The climatic conditions were probably unique to the present generation.

Macaria liturata—quite fifty per cent. of which were the variety *nigro-fulvata* (Collins)—began to emerge on the 11th from Delamere Forest larvæ; and *Agrotis ashworthii*, from Denbighshire larvæ collected in April, came out well from June 28th to July 18th. The month (June) ended with a thunderstorm.

Aplecta nebulosa, reared from Delamere Forest caterpillars, appeared during the latter part of June and beginning of July. The percentage of the variety *robsoni* ranged from four to eight, but we failed to get *thompsoni*. Both these forms are faithfully figured in "The Moths of the British Isles," p. 241, with the aid of photography and colour printing—*robsoni* with its grey fringes, and *thompsoni* with its white fringes.

With the exception of the 5th and 12th, July ran on to the 14th before we had a week of warmth. The chilly weather extended from the British Isles to the Azores. The coldest places on the 2nd were Belfast, Clacton and Nottingham, which all shivered in a temperature of forty-one degrees. It was colder in London than in the middle of November, 1906, when the thermometer rose comfortably to sixty-one degrees. Snow fell at Zermatt and was lying upon the hills within a few feet of newly cut hay!

On the 16th the electric lamps became worth working. The following is a list for that date—all taken about midnight, or after, and resting on the walls or pavement within a dozen yards of the lamps:—*Notodonta dictæa* (including the first female I ever took at the lamps and she obliged me with two hundred and fifty white eggs which began hatching on the 24th), *S. lubricipeda* and *S. menthastri*, *Miana strigilis* (all dark), *Caradrina morpheus*, *C. cubicularis*, *A. exclamations*, *Xylophasia polyodon*, *Habrostola triplasia*, *Plusia iota*, *Uropteryx sambucaria*, *Amphidasys betularia* var. *doubledayaria*, *Rumia crataegata*, *Boarmia rhomboidaria* and *Paraponyx stratiotalis*. On the 17th this list was varied by the appearance of *N. dictæoides*, *Herminia derivalis* and a black *X. polyodon*. On July 18th further additions were *A. caia*, *Phalera bucephala*, *P. festuæ* and *Phorodesma bajularia*.—J. ARKLE; Chester.

(To be continued.)

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 5th, 1908.*—Mr. C. O. Waterhouse, President, in the chair.—The President announced that he had nominated Dr. Thomas Algernon Chapman, M.D., F.Z.S., Professor Raphael Meldola, F.R.S., F.C.S., and Mr. Henry Rowland-Brown, M.A., as Vice-Presidents for the Session 1908-9.—The President announced that the Council had elected Mr. James William Tutt to serve as a member of the Council in the place of the late Mr. Arthur John Chitty, deceased.—Mr. C. Gordon Hewitt, M.Sc., of the University, Manchester, was elected a Fellow of the Society.—Dr. T. A. Chapman exhibited a collection of butterflies made last summer at Gavarnie, in the Pyrenees, including a number of specimens of *Erebia lefebvrei*, with *E. melas* from South-east Hungary, for comparison. He pointed out, and illustrated by means of enlarged photographs, the superficial differences in the wing-markings between the two species, and also drew attention to the fact that specimens of *Lycæna orbitulus* taken on the Simplon, Switzerland, are identical with *L. orbitulus* var. *oberthüri* of the Pyrenees.—Mr. H. St.-John Donisthorpe showed eleven species of ants taken in the hothouses in Kew Gardens in December, 1907, and January, 1908, eight being new to the published Kew list, and six species not before recorded as introduced in Britain.—Mr. J. E. Collin brought for exhibition microscopically mounted specimens of *Epidapus scabiei*, Hopk., a potato pest in the United States, and recently discovered in England attacking narcissus-bulbs by Mr. H. J. Charbonnier, of Bristol.—Commander J. J. Walker showed, on behalf of Mr. A. H. Hamm, very young larvæ of *Bitaris muralis*, hatched at end of October and beginning of November from ova laid by females in captivity (the natural place of deposit of these eggs being at the entrance to the burrow of the bee, *Anthophora pilipes*, in stone walls near Oxford). He also exhibited two specimens of the rare *Pyrallis lienigialis*, Zell., female, taken at light in his house at Summertown August, 1906 and 1907.—Mr. Rowland E. Turner brought for exhibition a box of Thynnidæ from S. America, mostly from Chile, and several new species from Mendoza and the Peruvian Andes.—Prof. T. Hudson Beare exhibited a specimen of *Trachyphlæus scabriculus*, taken at St. Margaret's Bay in August, 1907, with the two deciduous mandibles still in place.—Lieut.-Colonel Manders exhibited the female of *Papilio phorbanta* from Bourbon, an aberrant member of the *Nireus* group of Papilios, and compared it with the other members of the same group from the African mainland, Madagascar, and Mauritius, kindly lent for the purpose by Professor Poulton. He pointed out that, whereas in all the other species the females were some shade of green similar to the males, the Bourbon insect was more or less uniformly brown. He suggested that this was due to mimicry, *Euplæa goudoti*, a species strictly confined to Bourbon, being the model.—Dr. K. Jordan exhibited, on behalf of the Hon. Walter Rothschild, some interesting Papilionids, including *Troides alexandra*, Rothsch., remarkable for the beauty of the male, and the

gigantic size of the female, a new discovery by A. S. Meek, who found this fine insect in the north-eastern portion of British New Guinea, at some distance inland from the coast; and a gynandromorphic specimen of *Troides*, the only one known of this genus, obtained by Dr. L. Martin in South Celebes. It belongs to *T. haliphron*, the left side being female and the right side male.—Mr. R. Adkin exhibited specimens of *Tortrix pronubana*, Hb., reared in June and July from larvæ collected in May, also others reared in autumn from ova deposited by moths of the June emergence. He concluded that when the habits of the species came to be better understood, it would be found to be practically continuously brooded in this country, as had been shown to be the case in Guernsey.—Mr. L. W. Newman showed long series of *Melitæa aurinia*, from many localities in the United Kingdom, and *Notodonta chaonia*, to illustrate the wide superficial variation of the respective species.—Dr. F. A. Dixey exhibited specimens of *Nychitona medusa*, Cram., and *Pseudopontia paradoxa*, Feld., observing that a former suggestion of his as to a mimetic relation between them had been confirmed by a letter lately received from Mr. S. A. Neave, at present in the Congo State, who wrote that the two forms “inhabit exactly the same localities, and are barely distinguishable from each other on the wing.”—Mr. Rowland E. Turner communicated a paper “On Two Diplopterous Hymenoptera from Queensland,” and “Notes on Thynnidae, with remarks on some Aberrant Genera of the Scoliidæ.”—Mr. Guy A. K. Marshall read a paper “On Diaposematism, with reference to some Limitations of the Müllerian Hypothesis of Mimicry.” In this he pointed out the difficulty of accepting the idea of a mutual simultaneous mimicry between two unpalatable species, such as is postulated by the hypothesis of Diaposematism. A discussion was begun by Dr. F. A. Dixey and Professor E. B. Poulton, and adjourned to the next meeting.—The General Meeting which followed was adjourned to March 4th.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 9th, 1908.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. Sich exhibited a specimen of *Plodia interpunctella*, captured in the Society's rooms.—Mr. Gadge, specimens of *Malacosoma neustria*, from Chingford larvæ; one without a rudiment of the right hind wing, and the other with an extremely small left fore wing.—Mr. Turner, *Dercas verhuelli*, a Pierid near *G. rhamni*; and the “map” butterfly, *Cyrestis thyodamas*, both from the Khasia Hills, India.—Dr. Hodgson and Mr. Grosvenor, series and specimens of *Aricia agestis* (*astrarche*), including var. *salmacis*, ab. *obsoleta*. ab. *alpina*, var. *artaxerxes*, ab. *allous*, &c., from Reigate, Sussex, North England, and Aberdeen.—Mr. Adkin, series of *Tortrix pronubana*, *T. podana*, *T. heparana*, *T. rosana*, *T. forsterana*, and *Batodes angustiorana*, reared from larvæ taken on *Euonymus japonicus* at Eastbourne, in May and June, 1907; and read a paper entitled, “Further Notes on *Tortrix pronubana*, including its Life-history in Britain.”—Reports of the various field-meetings held during 1907 were submitted and read.—HY. J. TURNER, *Hon. Rep. Secretary*.

Annual Meeting, January 23rd, 1908.—Mr. R. Adkin, F.E.S.,

President, in the chair.—The Balance Sheet and Council's Report were read, and showed that the Society had closed another year of usefulness. The retiring President, Mr. R. Adkin, then read the Annual Address, in which, after dealing with recent entomological discoveries, observations, &c., he reviewed the past history of the Society at some length. The following is a list of the Officers and Council for the ensuing year:—President, A. Sich, F.E.S.; Vice-Presidents, R. Adkin, F.E.S., and W. J. Kaye, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dods; Curator, W. West (Greenwich); Hon. Corresponding Secretary, Stanley Edwards, F.L.S., F.Z.S.; Hon. Report Secretary, Hy. J. Turner, F.E.S.; Council, S. R. Ashby, F.E.S.; T. A. Chapman, M.D., F.Z.S., F.E.S.; H. Main, B.Sc., F.E.S.; A. L. Rayward, F.E.S.; E. Step, F.L.S.; and A. E. Tonge, F.E.S. In taking the chair Mr. Alfred Sich proposed and Mr. Step seconded a vote of thanks to Mr. Adkin, and Mr. Tutt, at some length, paid a warm tribute to the appreciation of Mr. Adkin's services in the Society for so many years.—Mr. B. Smith, of Upper Norwood, and Mr. E. R. Goffe, of Wandsworth Common, were elected members.—Mr. Rayward exhibited the hibernating larvæ of *Pseudoterpna pruinata*, on the stems of *Genista anglica*.—Mr. Newman, a large and varied series of *Amorpha populi*, mostly from captured larvæ.—HY. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, on the 20th January, 1908, Mr. Wm. Mansbridge, Vice-President, in the chair.—Mr. Robert Adkin, F.E.S., of Lewisham, was elected a member of the Society.—Mr. Oulton Harrison read a paper descriptive of recent photographs by Messrs. Harrison and Main, of London, illustrated by lantern slides of many interesting species and varieties of Lepidoptera in their various stages.—Dr. J. Cotton exhibited lantern-slides of Lepidoptera photographed in their natural colours by Lumière's process. The stereoscopic effect of the objects represented was especially noticed in this exhibit.—The Hon. Sec. exhibited, on behalf of Mr. T. Baxter, of St. Anne's-on-Sea, a case containing some of the most interesting varieties captured in 1907; they were as follows, *viz.*, (1) A long series of *Peronea hastiana*, comprising vars. *logiana*, Hüb., *divisana*, Stt., *leucopheana*, Bent., *albistriana*, Haw., *mayrana*, Hüb., *combustana*, Hüb., *centrovittana*, Steph., and other forms combining distinctly two of these, *viz.*, *logiana-centrovittana*, *leucopheana-mayrana*, and *albistriana-mayrana*; further, a water-colour drawing of other named variations captured or bred in previous years at St. Anne's. (2) *Agrotis cursoria* var. *costæcærulea*, Tutt, and var. *obscura*, Tutt, the latter being exceptionally dark. (3) A varied series of *Cidaria immanata*, taken at Forres. (4) A series of *Melanthia bicolorata*, showing transition from the type to var. *plumbata*, also from Forres. (5) Series of *Polia* var. *olivacea*, including a dark specimen, all from Co. Durham. (6) A fine variety of *Acronycta rumicis*, taken at St. Anne's in 1905; the basal, submarginal, and marginal areas black, otherwise as the type. (7) A short series of *Camptogramma bilineata*, banded form from Forres. (8) *Zygena filipendula* var. *hippocrepidis*, and one with the outer spots only confluent,

St. Anne's. (9) *Satyrus semele*, from St. Anne's and Fifeshire coast, the latter bearing much stronger markings on the under side; this form also occurs on the Crosby sandhills, but not at St. Anne's. (10) *Epinephele ianira*, from Fifeshire. (11) Series of *Lycæna icarus*, from coast of Fife, including a var. of the female with the spots of the under side showing through the wing as whitish blotches, and under side vars. of the male with many of the spots obsolete, or nearly so; all the females were exceptionally bright. (12) An ochreous var. of *Amphidasys betularia* female, captured wild at St. Anne's, June, 1891; also a fine intermediate, bred from typical male \times *doubledayaria* female.—Mr. Robert Adkin showed a series of *Tortrix prunubana*, bred from Eastbourne larvæ in 1907.—Mr. J. J. Richardson, an aberration of *Halia rauraria*, taken at light, Sefton Park, Liverpool.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*January 17th, 1908.* Rev. C. R. N. Burrows exhibited *Cucullia verbasci*, bred by Mr. Norgate from larvæ taken end of July, 1906, the imagines emerging in early May, 1907; some of the specimens were typical, but others were so light, and others again so dark, as to make them hardly recognizable as *C. verbasci*.—Mr. S. J. Bell, *Abraxas ulmata*, ranging from specimens with black markings almost obsolete to others in which these formed almost continuous fasciæ, Chalfont Road, July, 1906 and 1907.—Dr. S. A. Chapman, *Pterophorus brachydactylus*, a third generation bred at Reigate from Swiss stock.—Mr. J. A. Clark, two fine *Arctia caia* abs., one with yellow hind wings, from Leyton, the other with fore wings almost entirely deep brown with mere traces of the usual cream ground colour, and hind wings of an orange shade with black nervures and the black spots forming two wide bands.—Mr. H. M. Edelsten, *Sesia andreniformis*, bred in 1907, from Kent and Bedfordshire; also its rare parasite *Meniscus bilineatus*.—Mr. T. H. L. Grosvenor, very yellow *Pieris napi*, from Aberdeen; also *P. brassicæ*, from same locality, with fore wings heavily speckled with black at the base, and under side of hind wings similarly powdered.—Mr. A. Hemming, *Deilephila euphorbiæ*, taken at Eastbourne, 1907.—Mr. A. W. Mera, *Abraxas grossulariata* abs., from London and Aberdeen; in the London specimens the increase of black marking was usually most noticeable at the base of the wings, while the Scotch aberrations were usually blackest on the marginal areas.—Mr. L. W. Newman, *Notodonta chaonia*, bred from Perth and New Forest, those from the former district being much darker than the Hampshire broods.—Mr. P. H. Tautz, *Xylina semibrunnea*, from Brighton, and *Luperina cespitis* from Richmond Park.

January 21st.—Mr. L. W. Newman, *Smerinthus populi*, from Bexley, females varying from very light to very dark specimens.—Mr. P. H. Tautz, two series of *Vanessa io*, bred in 1905 and 1906 from larvæ taken at Chalfont Road and Chorley Wood respectively; the 1905 brood were normal, but those bred in 1906 had a transparent greasy appearance, while the ground colour of the wings was a pale dingy brown.—Mr. A. J. Willsdon, *Pararge egeria*, bred January 20th, from ova laid by females taken at Torquay, end of September, 1907. The first imago appeared on December 25th, and it was

noticed that, although the pupæ remained in the warm room in which the larvæ were reared, emergence ceased whenever frost set in, and was not resumed until milder weather returned.—Dr. G. G. C. Hodgson read a paper in which he advanced the theory that variations in climatic conditions tended to increase or decrease sexual dimorphism; from observations made and material collected during a number of years he deduced the apparent facts that in hot sunny years sexual dimorphism was increased, while in cold rainy years this dimorphism was lessened.—S. T. BELL, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*January 20th, 1908.*—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed larva of *Lasiocampa quercus* L. from near Barmouth, together under the Tachinid parasites *Tachina larvarum*, L., which he had bred from it.—Mr. G. T. Bethune-Baker, a fine collection of African Papilionidæ in three boxes.—Mr. C. J. Wainwright, *Platycheirus melanopsis* Lw., female from Riffelalp, Valais, Switzerland; also *Campsicnemus magius*, Lw., and called attention to the extraordinary tarsi in the male sex.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

HERTFORDSHIRE NATURAL HISTORY SOCIETY.—At the December meeting of this Society, held at the County Museum, St. Albans, Dr. John Morison, Vice-President, in the chair, Mr. A. E. Gibbs, the Hon. Secretary, exhibited a small collection of butterflies received from a correspondent in Japan, and compared the forms of the same species found at the extreme eastern and western limits of the Palæarctic Region. He pointed out that the Japanese insects were, as a rule, larger in size and darker in colour than the British forms, and exhibited specimens of *Papilio machaon*, *Pieris rapæ*, *P. napi*, *Chrysophanus phleas*, and others in illustration of this fact. At the meeting of the same Society held on January 28th, Mr. Gibbs exhibited a small collection of Diptera in four drawers, which Mr. P. J. Barraud, Mr. T. F. Furnival and he had collected for and presented to the County Museum. The families which contained the smaller species were very poorly represented, and Mr. Gibbs expressed the hope that some member of the Society would undertake the study of them.—A. E. GIBBS, St. Albans.

RECENT LITERATURE.

The Agricultural Journal of India. Vol. ii., parts i.-iv. (January, April, July, October, 1907).

THE entomological articles are by Mr. H. Maxwell Lefroy, and comprise "Surface Caterpillars," pp. 42-46; "Insect Pests of India," pp. 109-115; "Locusts in India," pp. 238-245, plates xiv.-xx.; "Practical Remedies for Insect Pests," pp. 355-363; and "The Tse-Tse Fly in India," pp. 374-376. On the coloured plates illustrating the first-named articles are figures of *Agrotis ypsilon*, Rott., and its early stages; also figures of *A. flammatrix*, Schiff., *E. spinifera*, Schiff., and *E. segetis*, Hübn.

Memoirs of the Department of Agriculture in India.

NUMBERS 1-5, published during 1907, have been received. In these Mr. H. Maxwell Lefroy, the Imperial Entomologist, treats of "The Bombay Locust" (No. 1), and "The More Important Insects Injurious to Indian Agriculture" (No. 2), pp. 1-252. In No. 3, "The Indian Surface Caterpillars of the Genus *Agrotis*" are dealt with by Mr. Lefroy (pp. 253-259); and Mr. C. C. Ghosh contributes "The Life-history of *Agrotis ypsilon*" (pp. 260-274). Dr. Harold H. Mann discusses "Individual and Seasonal Variation in *Helopeltis theivora*, Waterhouse" (No. 4), and adds a description of a new species of the genus (pp. 275-337). No. 5 contains a paper by Mr. E. E. Green and Dr. Mann, entitled "The Coccidæ attacking the Tea-plant in India and Ceylon" (pp. 338-355). There are a number of plates, mostly coloured, and many illustrations in the text.

United States Department of Agriculture:—

Bulletin No. 68, parts i.-v.—Papers by A. A. Girault and A. L. Quaintance on Deciduous Fruit Insects and Insecticides.

Bulletin No. 69.—The Chinch Bug (*Blissus leucopterus*, Say). By F. W. Webster.

Bulletin No. 70.—Report of the Meeting of Inspectors of Apiaries, San Antonio, Texas, November 12th, 1906.

Bulletin No. 72.—Information concerning the North American Fever Tick, with Notes on other Species. By W. D. Hunter and W. A. Hooker.

Bulletin No. 74.—Some Factors in the Natural Control of the Mexican Cotton Boll Weevils. By W. E. Hinds, Ph.D.

Bulletin No. 75.—Miscellaneous Papers on Agriculture. Part i.: Production and Care of Extracted Honey. By E. F. Phillips, Ph.D. Methods of Honey-testing for Bee Keepers. By C. A. Browne, Ph.D. Part ii.: Wax Moths and American Foul Brood. By E. F. Phillips.

From the 'Proceedings of the United States National Museum,' vol. xxxiii. :—

Descriptions of New North American Tineid Moths, with a Generic Table of the Family Blastobasidæ. By Lord Walsingham (October 29th, 1907).

The Dragonflies (Odonata) of Burma and Lower Siam. ii. Sub-families Cordulegasterinæ, Chlorogomphinæ, and Gomphinæ. By Edward Bruce Williamson (December 13th, 1907).

Papers by John B. Smith, Sc.D. :—

Notes on the Species of *Amathes*, Hübn. Pp. 345-379, plates ix. x. (Trans. Am. Ent. Soc. xxxiii., November, 1907).

Notes of the Brehidæ. Pp. 369-371 ('Canadian Entomologist,' November, 1907).

New Species and Genera of the Lepidopterous Family Noctuidæ for 1907. Pp. 91-127 (Annals New York Acad. Sci. vol. xviii. pt. ii. January 22nd, 1908).

OBITUARY.—We have heard with very great regret of the death of Mr. HERBERT GOSS. A further notice will appear in our next issue.

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APRIL, 1908.

[No. 539

JOHN THOMAS CARRINGTON.

WE regret to announce a further gap in the rapidly thinning ranks of the older entomologists.

Born on March 21st, 1846, John Thomas Carrington was the second son of Charles Carrington, of Crofts Bank House, Lancashire, and was educated at a private school at Mottram, Cheshire, and afterwards in Dublin. He originally studied for the medical profession, but after extensive travels in North and South America, and also in Africa, he finally adopted journalism as his profession.

In 1876, on the death of Edward Newman, he was appointed editor of this magazine, a position he occupied with conspicuous ability and tact until its purchase by the late Mr. John Henry Leech in 1890.

In 1878 he took a leading part in organizing and managing the National Entomological Exhibition at the Westminster Aquarium, at which the finest representative collection of British Entomology ever brought together was exhibited to the public. In 1893 he bought 'Science Gossip,' which he edited until it finally ceased in 1902. For many years he was one of the departmental (Natural History) editors of the 'Field.'

But it was not on the literary side alone that his energies showed themselves. An all-round naturalist, he delighted in getting away from business cares and carefully exploring the lesser known districts around London and Brighton. In the course of one of these excursions (September, 1896) he captured the unique British specimen of *Calophasia platyptera*, Esp. Those who had the good fortune to accompany him at any of these times will never forget the pleasure they gave. His knowledge of British Conchology, Botany, and Ornithology, so freely afforded, his carefully arranged routes, and above all his genial manner and the genuine pleasure he showed in pointing out some new feature or rare specimen, rendered them ever to be remembered.

He married (in 1869) Annette, youngest daughter of John Crawford, Esq., solicitor, of Holly Mount, Co. Meath, by whom he had three sons, two of whom, now resident in America, survive him.

He recently retired to Combe Martin, North Devon, where he took a great interest in the proposed reopening of the famous silver mines, but shortly before Christmas he contracted a severe chill, from the effects of which he never recovered, and after many weeks of acute suffering, patiently endured, pneumonia set in, and he died on March 5th, aged sixty-two.

C. A. B.

HERBERT GOSS, F.L.S., F.E.S.

HERBERT Goss died on February 14th last at his house in The Avenue, Surbiton Hill, after a somewhat lingering illness. Born in "the fifties" in Brompton, he early evinced a decided love for natural history, and there is a story in his family that he started butterfly hunting at the age of six with the top of a hat-box covered with muslin for a net! Educated by private tutors, he finally entered the Solicitors' Department of the General Post Office in May, 1871, retiring in June, 1906.

From his earliest boyhood he took a keen interest in the British Lepidoptera, and later specialized as an authority on fossil insects, his papers on the subject, contributed to the 'Entomologist's Monthly Magazine,'* being afterwards reprinted, and in this form they were widely read and appreciated both at home and abroad, and commented upon with favour by such authorities as Bargagli in the 'Bulletin of the Entomological Society of Italy' (Florence, 1886). As a Fellow of the Geological Society of London, he had already contributed to the 'Proceedings' the Insect Fauna of the Recent and Tertiary Periods (1877), of the Secondary or Mesozoic Period (1878), of the Primary or Palæozoic Period (1879), and lastly a paper "On some Recently Discovered Insects from Carboniferous and Silurian Rocks," while his "Geological Antiquity of Insects" appeared in 1880. Meanwhile many notices in the 'Entomologist's Monthly' and the 'Entomologist' testify to his keen interest and powers of observation in field-work, while presently as one of the first Secretaries in co-operation with the Rev. Canon W. N. Fowler, his experience in the General Post Office was destined to be of the greatest value to the then newly chartered Entomological Society of London. Elected a member in 1874, he joined the Council ten years later, and when Mr. E. A. Fitch and Mr. W. R. Kirby relinquished the

* See also "Notes on a Fossil Wing of a Dragonfly from the Bournemouth Leaf Beds," by H. Goss (Entom. vol. xi. p. 192), and "Fossil Insects" (*ibid.*, vol. xviii. p. 196).

secretaryship in the following year (1885) he stepped into one of the vacant places. Here he continued in office until the long partnership was dissolved at the close of 1896, when ill-health for a time compelled him to withdraw. But in 1901 he resumed his post until his final resignation at the end of 1904 of those duties which he had performed with such conspicuous ability and zeal. To his punctuality and precise habit of mind, characteristic alike of his entomological and official life, we owe much of the improved methods introduced into our 'Transactions' and 'Proceedings.' In the Council his advice was constantly sought, and willingly given, while he was equally ready to assist his brothers of the net with technical information, and as an incisive speaker and writer to champion their rights when the Government of the day was minded to enclose vast tracts of the wild and beautiful country in the New Forest, his particular and happy hunting-ground.* The results of some at least of his observations have been preserved in the laborious local catalogues of insects published in the 'Victoria County Histories.' The lists of Lepidoptera enumerated in the volumes for Hampshire, Sussex, Surrey, Devon, and Northamptonshire are largely his work; in the four first-mentioned counties they display a close intimacy with the insect fauna under review. Indeed, he had by his own personal field-work got together one of the most complete collections of British Butterflies in the country.

Goss's interests, however, were by no means confined to entomological and geological science. He was a first-rate musician—a brilliant pianist in his earlier days—and quite recently delivered a lecture at the Surbiton Institute on the "Band of Nebuchadnezzar," which was as full of archæological lore as of genuine humour. He also did good work on the Council of the National Trust for the Preservation of Places of Historic Interest or Natural Beauty, and possessed a considerable knowledge of botany, in pursuit of which he formed a herbarium containing many rare and valuable specimens.

In 1906 he was nominated one of the Vice-Presidents of the Entomological Society, and in this capacity he attended the last meeting at which he was present. His genial presence will be missed by many friends, and by none more than the writer of this notice, who was also his colleague for the whole of his second term of office as Secretary.

H. ROWLAND-BROWN.

* New Forest: "Trespassers will be Prosecuted," by Herbert Goss, F.L.S. (Entom. vol. xviii. p. 313).

GEOMETRID NOTES.

BY LOUIS B. PROUT, F.E.S.

1. OPEROPHTERA RELEGATA, mihi, n. nom. = NEXIFASCIATA, Leech,
nec Butl.

I find that the Japanese species of *Operophtera* catalogued by Mr. Leech (Ann. Mag. Nat. Hist. (6), xix. 671) as *Oporabia nexifasciata* has never been named. The true *O. nexifasciata* of Butler (Trans. Ent. Soc. Lond. 1881, 420) was, as his description and type-specimen show, synonymous with, or at least extremely close to, *Hydriomena furcata*, Thnbg. = *sordidata*, Fb., and the transference of the name evidently came about through Butler having placed it in *Oporabia*, and compared it with *dilutata*, which gives, at the outset, an entirely erroneous impression. I have measured the type-specimen, and find it barely 1 inch 5 lines, not "1 inch 6 lines," as Butler gives. The new species (*relegata*) is clearly an *Operophtera*, showing all the structural characters given by Meyrick for that genus.* Leech's description—"very closely allied to *Oporabia dilutata*, Bork., but the antennæ are more strongly fasciculated, and the first transverse band of primaries is straight"—evidently overlooks the neurata, and may be emended and amplified as follows:—

Operophtera relegata, mihi. — Male, 35–40 mm. Whitish grey, speckled with fuscous, more sparsely behind second band. Basal line angulated, followed by some very ill-defined dark lines or shadings; inner line at a little beyond one-third, accompanied behind by another line, the interspace usually filled in with fuscous so as to form a narrow bar which runs nearly straight from costa to inner margin, or slightly oblique inwards; outer line at beyond one-half, formed much as in *Epirrita dilutata*, followed by a rather broad diffuse fuscous shade, which is traversed by other indistinct lines, and forms a vague band; subterminal slightly nearer margin than in *E. dilutata*; marginal area more or less marked with fuscous, a short oblique dash just below apex; a very fine inconspicuous dark marginal line; fringes nearly concolorous, inner half slightly darker than outer, inconspicuously fuscous spotted at vein ends. Hind wings paler, traversed by a few indistinct pale fuscous lines, the most definite being near to and parallel with the hind margin. Under side weakly marked, otherwise similar to upper. A somewhat variable species in the distinctness and exact position of the transverse lines, but uniform in colour and general aspect. Female unknown. The male resembles *E. dilutata*, but with fore wings slightly narrower, and more acute at the apex.

* Vein 6 of the fore wings is shorter-stalked with 7–9 than in *O. brumata* and *borcata*, but this is liable to some individual variation in the genus; see *infra* on *O. japonaria*.

Japan (Pryer coll., &c.). Type (male) and six others in coll. Brit. Mus. One male in coll. L. B. Prout.

2. OPEROPHTERA JAPONARIA (Leech).

This species, described in Ent. Supp. 1891, 48, as *Oporabia japonaria*, must also, on account of the single long areole, be transferred to *Operophtera*. Vein 6, as in *O. relegata*, is normally short-stalked with 7-9, but in one aberrant specimen out of eight examined it arises separately from the angle of the cell. The female, like those of its true congeners, so far as they are known, is semiapterous. Leech merely says (*loc. cit.*) that it has "all the characteristic markings of the male"; the sole example from his collection shows the fore wings about the length of abdomen, narrower and more acute at the produced inner angle than in *O. boreata*, Hüb., the hind wings very short and extremely narrow, apparently somewhat crippled.

3. CÆNOCALPE CENTROSTRIGARIA (Woll.).

This species, though not quite such a cosmopolitan as its cousin *fluviala*, has an even wider distribution than Staudinger ascribes to it. I have it from Jamaica and Buenos Ayres, and believe it occurs very generally in Atlantic America, both North and South. It has been suggested, though I think the suggestion is unpublished, that it is the *Eubolia custodiata* of Guenée (Spec. Gen. x. 490), in which case that would be the oldest name; but I hold the union to be impossible. Hulst's determination of *custodiata* as = *Ochyria guenéeata*, Pack., is much more satisfactory. At any rate, *custodiata* was a larger insect than *centrostrigaria*, and was described from California; whereas my friend Mr. R. F. Pearsall writes me that he does not know *centrostrigaria* from west of the Alleghany and Appalachian Mountains—at any rate, certainly not from the far west. The correct synonymy seems to be:—

Coremia centrostrigaria, Woll., Ann. Mag. (3), i. 119.

Phibalapteryx latirupta, Walk., xxxv. 1684.

Cidaria luscinata, Zell., Verh. Wien. xxiii. 205.

C. interruptata, Rbl., Ann. Hofmus. ix. 76.

Plemyria paranensis, Schs., Trans. Amer. Ent. Soc. xxvii. 273.

The last synonym is new, but is certain, according to examples named by Schaus himself.

4. ENTEPHRIA CÆSIATA (Schiff.).

Scarcely had the final proofs of my paper on the variation of this species (Trans. City Lond. Ent. Soc. pt. xvii. 1907) left my hands before I came across two references which I should have liked to include there. A synonym to *ab. annosata*, Zett., is var. (*ab.*) *nigristiaria*, Gregs. (Ent. v. 75), described as having "deep

blackish brown central band." [*Cidaria*] *Entephria aurata*, Pack., for which no reference is given in Dyar's list, was published in Proc. Bost. Soc. xi. 51 (1866), and is, as Grossbeck has just shown in some interesting Geometrid notes (Trans. Amer. Ent. Soc. xxxiii. 338) the oldest name for the eastern American species which has been passing for *cæsiata*, Schiff. Grote's *inventariaia* will possibly prove a synonym of *Entephria aurata*.

5. CYLLOPODA JATROPHARIA (Linn.).

This common species is frequently recorded as *Cyllopoda* (or *Atyria* or *Flavinia*) *osiris*, Cram., and until recently stood under that name in the British Museum collection. As a result, when the rare form (or close ally) with the broad marginal band to the hind wings turned up in British Guiana, Mr. Warren (Nov. Zool. iv. 420) named it *Cyllopoda latimargo*, sp. nov.; whereas a reference to Cramer's figure shows that that is precisely the form which he named *osiris*, while Clerck's figure (no doubt from the Queen of Sweden's collection) shows with equal clearness that the common form is the *Phalæna Geometra jatrophia* of Linnæus. I only know the true *osiris* from British and Dutch Guiana. The corrected synonymy of the two forms is:—

(a) *Cyllopoda jatrophia* (Linn.).

Phalæna Geometra jatrophia, Linn., Syst. Nat. ed. 10, 523 (1758); Clerck, Ic. ii. tab. 55, 3 (1764).

Atyria osiris, auctt., nec Cram.

? *Cyllopoda ovata*, Warr., Nov. Zool. xiv. 198 (1907), syn. nov.

(b) *Cyllopoda osiris* (Cram.).

Phalæna osiris, Cram., Pap. Exot. ii. 28, tab. 115 E (1777).

Cyllopoda latimargo, Warr., Nov. Zool. iv. 420 (1897).

Cramer himself was the first to start the confusion, for on p. 151 he sinks his own species to that of Linnæus.

6. SEMIOTHISA REGULATA (Fabr.).

Guenée (Spec. Gén. x. 68) readily recognized the *Phalæna regulata* of Fabricius as "certainement de ce genre" (*Macaria* = *Semiothisa*), but was unable to decide to which of the many American species it should be referred. I have examined the type in the Banksian collection, and find it is the common species which Guenée himself named *enotata*. The following will be a sufficient synonymy:—

Phalæna regulata, Fb., Syst. Ent. 629 (1775).

P. notata, Stoll, in Cram. Pap. Exot. iv. 160, tab. 371, G, H (1781), nec Linn.

Macaria enotata, Guen., Spec. Gén. x. 69 (1858).

7. *SEMIOTHISA RICHARDSI*, mihi, sp. nov.*

Male, 25 or 26 mm. Pale fawn-colour, with extremely faint indications of somewhat darker, more ochreous transverse lines or shades. Fore wings with a pale outer line at just beyond two-thirds, nearly parallel to hind margin, but curving very slightly outwards at inner marginal end. In the region of this line and bisected by it are some blackish marks, namely: between veins 2-3, 3-4, 4-5 rather large wedges, the one between veins 4-5 the smallest, that between 3-4 the largest, further interrupted (as is also that between 2-3) near its outer extremity by another very fine pale line; between veins 5 and 8-9 smaller and more irregular dark spots, inclining to form a row of three each longitudinally. Hind wings also with pale post-medial line (which is here very indistinct), and with small irregular blackish markings on either side of it between veins 2 and 4. Fringes concolorous, fuscous-spotted. Under side bright golden brown, vaguely spotted with whitish, the whitish markings somewhat inclined to dispose themselves in transverse lines. Margins of wings almost even throughout, hind wings very slightly produced at vein 4.

Female unknown.

Tientsin; one male, in my collection.

In its ground colour and the general pose of the markings this species reminds somewhat of the least strongly-marked examples of *Semiothisa ornataria*, Leech (Ann. Mag. Nat. Hist. ser. 6, xix. 310) from Moupin, but besides the absence of the spot on costa towards apex and other slight differences of arrangement the shape of the wings and the scheme of the under side are quite different, agreeing with those of *Tephрина murinaria*, Schiff., in its brightest coloured forms. The antennal ciliations are normal for *Semiothisa*.

8. *STEGANIA HONESTA*, mihi, sp. nov.

Sexes similar. 26 mm. Fore wings reddish buff or pale testaceous, somewhat variable in different individuals, rather thickly but smoothly scaled, glossy. Two indistinctly darker transverse lines following practically the same course as in *Stegania trimaculata*, Vill., and starting from dark costal spots (deep red-brown or blackish), as in that species, but rather larger on the average. No third costal spot. The second line accompanied distally by a narrow paler line, which renders it more conspicuous. Outer margin very slightly darkened. Fringes concolorous with wing internally, grey externally, intersected with whitish at vein-ends. Hind wings much paler, especially interiorly, and traversed by a single darker line (sometimes very indistinct), following the same course as in *S. trimaculata*. Under side almost without markings, or (in some individuals) with the outer line of all wings more or less well expressed. Face deep buff, vertex white. Antennæ of male with rather long pectinations,

* Dedicated to my friend Mr. Percy Richards, to whose kindness I am indebted for this pretty little species, as well as for the one next to be described.

rapidly decreasing in length towards apex, which is simple ; of female shortly ciliated.

Tientsin. Types (male and female) in coll. L. B. Prout ; one male, one female in coll. Brit. Mus.

I refer this species provisionally to *Stegania*, with which it so well agrees in its general facies, but it is aberrant in having veins 10 and 11 long-stalked instead of coincident throughout (or "10 absent," as it is generally expressed). It is also slightly more robust, abdomen somewhat longer, palpi stronger.

NOTES ON *CARADRINA* (*LAPHYGMA*) *EXIGUA*.

BY G. F. RAWLINGS.

My first meeting with this beautiful little moth was on May 30th, 1906, when I took a very fine male in perfect condition. I saw no more until August 9th, after which date I took some practically every night for a month, taking the last specimen on September 9th.

My best night was fourteen, total captures fifty-two ; but I saw several others during the month, which escaped.

They were very strong on the wing and very lively. Even on roughish nights when other insects were few, they soared about as though revelling in the wind. I have also noticed this with *ambigua*.

The moths were fairly regular in their arrival, the first generally arriving about 11 p.m., then at 12.30 and at 2 a.m., the last lot, as a rule, the largest in numbers. Nearly all the males have a beautiful process composed of very fine hairs radiating from a stalk attached to the thorax just between the front pair of legs and protruding forward, sometimes beyond the head ; it looks like very fine thistle-down.

Though I had about a dozen batches of ova, and must have hatched over a thousand larvæ, I did not succeed in pupating any. Most of them died off when apparently full-grown, though some died at an earlier stage.

The disease started with some larvæ of *Phalera* (*Pygæra*) *bucephala* I was trying to rear for experimental purposes, and though my larvæ were divided up very much, I lost all that I had.

The first ova were deposited on August 11th by a female captured on the 9th. They were deposited in small batches with here and there a few odd ones. In shape they reminded me of a sea urchin with longitudinal lines.

When fresh they look like small pearls, having the beautiful pearly lustre so conspicuous on the hind wings of the imago. About the fifth day they were grey, black on the sixth, and the larvæ hatched on the seventh.

The young larvæ in most cases ate their egg-shells, but some were left undamaged save for the hole made by the larva to escape from the shell.

The ova were attached to the box and covered with a downy mass of fine hairs, varying in colour from greyish-brown to white; the latter probably being the fringes of the hind wings, and the former from the body and thorax. In some cases the hairs were missing, the ova being quite exposed. I was unable to determine if these had been deposited by a female who had lost or used all her hairs or not, but from the very much greater proportion of covered ones, I am inclined to think that the covering is usual.

For a fuller description of the ova I cannot do better than refer the reader to the excellent article on the subject by Mr. Alfred Sich, F.E.S., on page 267 of the 'Entomologist' for December, 1906.

When first hatched the young larvæ were dark grey with black head and plate. They took readily to dock, plantain, *Calystigia sepium*, and *Convolvulus arvensis*. After feeding, they turned a pale greenish colour; spots appeared on the fifth day, and on the sixth, when they had apparently moulted, lines were discernible. Five days later these markings were much more brilliant and distinct. They varied in colour from pale apple-green to very dark sage, while others were pale brown with a slight pinkish tinge; others were darker brown, and some nearly black. All these varieties were of a pale ground colour, but the upper half was so lined and streaked with various shades and thicknesses of darker colour as to give it a shagreen-like appearance, the bands being formed by the different density and thickness of these lines and streaks. There is a gloss over all which gives the larvæ a most beautiful velvety appearance. Head, plate, and legs are black. The largest, apparently full-grown, larvæ measured slightly under an inch and a quarter when fully extended, of uniform and moderate thickness, tapering slightly at the first, second, and thirteenth segments. Spiracles very delicately outlined in dark green, brown, or black. Spiracular line white. The subdorsal band darker than the dorsal area, and equaling about half its width, and extending the whole length of the back; this band is bordered at its outside edge by a very much darker line, which divides it from the spiracular line. This darker line is broken up into a series of short lines extending in a forward direction from each spiracle to a small white spot, which is situated slightly behind and above the next spiracle. These short lines are broadest and most pronounced on the hinder portion of each segment, from where they touch the white spot, to the fold.

The space between each spiracle and its accompanying white spot is paler than the surrounding area, breaking up both the

dark and spiracular lines, the white spot looking as though it were a piece of the spiracular line, which it equals in width, placed slightly above but touching the interrupted end of the dark line. These markings are most pronounced on the spiracle-bearing segments, the dark lines being scarcely discernible on the second, third, and thirteenth. The white spots bear an exceedingly fine hair, are one-sixty-fourth of an inch in diameter, and are placed on the segment just midway between the folds.

The dorsal area is marked with a short, thick, dark dash, situated on the anterior edge of each segment, and extending down the centre of each about a quarter of its depth. A thin light-coloured line extends in a similar manner from the posterior edge of the segment towards the dark dash. The combined length of these two lines equals half the depth of the segment, the intervening space being the colour of the rest of the dorsal area. On each side of the dark dash, level with its hindmost point and midway between the centre of the back and the subdorsal band, there is a white spot about half the size of the spots near the spiracles.

The under surface is very pale and faintly marbled with the darker markings and whitish spots.

DESCRIPTIONS OF TWO NEW GENERA AND SPECIES OF ICHNEUMONIDÆ (XORIDINI) FROM BORNEO.

By P. CAMERON.

PARAXYLOPHRURUS, gen. nov.

Areolet small, four-angled, the transverse cubital nervures almost united in front; transverse median nervure interstitial; disco-cubital nervure unbroken; transverse median nervure in hind wings broken near the top. Head cubital, the temples of moderate size, roundly dilated; the occiput roundly incised, finely margined. Eyes large, converging below, reaching almost to the base of the mandibles. Mouth with a semicircular emargination. Mesonotum distinctly trilobate. Abdomen smooth, the first segment as long as the following two united, its under side toothed near the base, the narrowed basal part behind the prominent spiracles of equal width; the rest becomes gradually widened towards the apex. Legs (and particularly the hinder) long, the hind coxæ about four times longer than wide; claws with a tooth at the base. Tibiæ spinose, the anterior not contracted at the base. Ovipositor long. Mandibles of equal length. The middle lobe of mesonotum does not project above the lateral. Metanotum and metapleuræ closely reticulated; its spiracles rather small, twice longer than wide.

In Dr. Ashmead's classification this genus of Xoridini runs

close to *Xylophrurus*, which may be known from it by the transverse median nervure being broken *below* the middle.

In size, form, and coloration this genus resembles *Allostomus* here described, but may readily be separated from it by the semi-circular oral opening, and by the presence of an areolet in the fore wings. In Ashmead's tables the genus runs near to *Gabunia* and *Xylophrurus*, with neither of which has it any close relationship.

Paraxylophrurus maculiseutis, sp. nov.

Black; face, under side of antennal scape, the lower side of propleuræ, the line dilated at the base, the apex gradually narrowed, tegulæ, the scutellum except the basal slope, the mark rounded at the base, a semicircular mark on apex of post-scutellum, tubercles, a small mark below the hind wings, the first abdominal segment behind the spiracles, and lines on the apices of all of them, lemon-yellow. Legs of a brighter lemon-yellow; the apical two-thirds of the hind coxæ above, the basal three-fourths of the lower side, the apical joint of their trochanters and a band between the middle and apex of the hind tibiæ, black. Wings hyaline, the stigma and nervures black. ♀. Length, 13 mm.; terebra, 7 mm.

Kuching (John Hewitt).

The antennæ have a broad white band in the middle. Head, pro- and mesothorax smooth and shining, the metathorax closely reticulated all over. Abdomen smooth and shining. The four anterior tarsi and the apex of posterior fuscous. Tarsi closely spinose.

ALLOSTOMUS, gen. nov.

Wings without an areolet; neither the disco-cubital nor the second recurrent nervure broken by a stump; transverse median nervure received very shortly beyond the transverse basal; transverse median nervure in hind wings broken distinctly above the middle. Eyes large, converging below, reaching close to the base of the mandibles. Clypeus separated from the face, bounded at the sides and below by furrows, the lateral furrows the wider and ending above in a fovea. Mandibles unequal, edentate, bluntly pointed. There is a tubercle above and between the antennæ; the latter are as long as the body. Temples well developed, roundly dilated; occiput margined, roundly incised. Mesonotum trilobate. Metanotum longish, closely reticulated, the spiracles placed behind the middle, longish oval, about three times longer than wide. First abdominal segment longer than the second, its base half the length of the apex. Legs (including the four hinder coxæ) long, slender; the base of the tibiæ not contracted. The antennæ are broadly ringed with white. There is a long ovipositor. The prothorax broadly projects laterally, and is thus clearly separated from the mesothorax. Calcaria short. Claws conspicuous, curved. There are eight abdominal segments.

A distinct genus. In Ashmead's arrangement it comes in near *Clepticus* and *Epixorides*, with neither of which can it be confounded. *Lethulia*, Cam. (from Borneo) has three areæ on the metanotum, the abdominal petiole is longer than the follow-

ing three segments united, the four anterior claws are bifid, and the mandibles have a short subapical tooth.

Allostomus maculiseutis, sp. nov.

Black; the face, base of prothorax, a large mark on either side of the prosternum, tegulæ, tubercles, a line down the apex of mesopleuræ, the base of the first abdominal segment, and a line on the apices of all the segments, bright lemon-yellow. Legs yellow, tinged with fulvous; the apical half of all the coxæ above, more than the apical half of the posterior trochanters, the four anterior femora, the apex of the posterior all round, the four anterior tibiæ above, their tarsi, a mark near the base of the posterior tibiæ, their apex all round, and the apical joint of the hind tarsi, black. The apex of the sixth antennal joint and the following to the nineteenth white; the basal five joints (including the scape) are white below. Wings hyaline, the stigma and nervures black. ♀. Length, 14 mm.; terebra, 10 mm.

Kuching, November (John Hewitt).

Front almost smooth, the vertex sparsely punctured; the face sparsely but more strongly punctured. Pro- and mesothorax closely punctured, the outer side of the middle lobe of the latter striated; the propleuræ, except at the top and bottom, smooth. Metathorax closely reticulated; there is a keel over the metasternum. Basal two segments of abdomen distinctly, closely, the third weakly punctured; the others almost smooth. The metathorax and coxæ are thickly covered with short white pubescence.

NEW AFRICAN BEES.

By T. D. A. COCKERELL.

THE bees described below were collected in the interior of Portuguese West Africa, in the same general locality as those previously reported.

Thrinchostoma wellmani, sp. nov.

♀. Length about 12 mm.; anterior wing 9 mm.; black, with short greyish-white pubescence; antennæ dark, ordinary; ocelli close together; front finely punctured; sides of face with silvery hair; malar space longer than broad; clypeus produced as usual, with sparse strong punctures; maxillary palpi six-jointed, third joint short and thick, last long and slender; labial palpi four-jointed, the first longest; tongue long and slender, as is usual in the genus; mesothorax and scutellum dull, densely and minutely rugosopunctate; area of metathorax coarsely granular; sides of metathorax with white tomentum; pleura with coarse white hair; wings ample, dusky, the apical margin broadly fuscous; stigma and nervures dark sepia; b. n. falling short of t. m.; first s. m. longer than third; second large and nearly square; first r. n. reaching extreme base of third s. m.; third t. c. with a double curve; t. m. bent; tegulæ shining piceous, with a

large pallid spot in front; legs black, including the tarsi; abdomen black, the hind margins of segments 2 to 4 broadly whitish, and with fine silvery hair on third and fourth.

Hab. Benguella, "found dead" (Wellman, 1474). The genus *Thrinchostoma* was founded on a species from Madagascar; but a second species, *T. productum* (*Halictus productus*, Smith), is known from Sierra Leone and the French Congo. *T. productum* is readily known from *T. wellmani* by its smaller size; the female (according to Vachal) being $8\frac{1}{2}$ mm. long, with the anterior wing $6\frac{1}{2}$ mm. *Diagozonus bicometes*, Enderlein, from the Cameroons, is also closely related, and it is a question whether the genus *Diagozonus* should be maintained. Enderlein himself states that *Halictus productus* appears to belong to his genus, apparently overlooking *Thrinchostoma*; but, nevertheless, there are some characters in the wing of *Diagozonus* which may perhaps entitle it to recognition as a valid genus.

Nomia amabilis, sp. nov.

♀. Length nearly 14 mm., anterior wing a little over 10; black, robust, with the pubescence partly dull white and partly black; abdomen with broad but very widely interrupted (the middle third missing) light sky-blue tegumentary bands on the first four segments; scutellum prolonged into a backwardly-directed lobe on each side; postscutellum W-like, with two prominent but obtuse angular projections. Head broad, with much white hair; clypeus dull, striatulate-granular, with a faint rather shining median ridge; antennæ dark, but the fifth joint orange-ferruginous beneath; flagellum rather thick; mesothorax dull and densely punctured, with black hair, except at the sides; pleura, tubercles and sides of metathorax with copious white hair; tegulæ large, black; wings very dark, nervures and stigma black; legs black, with the hair partly black and partly white, but orange-ferruginous on inner side of basitarsi, especially the last; hind tibiæ with the hair black on outer and yellowish-white on posterior face; middle tibiæ with the hair of basal half of outer face mostly white, and of apical half mostly black; anterior tibiæ with the black confined to the apical fourth; abdomen above with scanty black hair; fifth segment covered with orange-ferruginous hair, with some black bristles overlapping; apex with black hair.

Hab. Benguella, "flying near a house" (Wellman, 1469). This agrees in the structure of the scutellum and postscutellum with *N. scutellaris*, Sauss., from Madagascar; but differs by the very dark wings, and the beautiful blue markings of the abdomen. Friese has described two forms of the *scutellaris*-group from the African mainland: *N. maculata* (Friese) and *N. nigripes* (Friese). These differ from *N. amabilis* in having the abdominal markings reduced to quadrate spots on each side, of a bluish-white colour; while the wings are only moderately dark, as in *scutellaris*. From the blue markings on the abdomen, *N. amabilis* looks at first sight like a *Crocisa*.

Mesotrichia orthosiphonis, sp. nov.

♀. Length about 16 mm.; anterior wing about 14; width of abdomen about $8\frac{1}{2}$; face between the eyes about 4 mm. wide. Black; the thorax above, the upper third or less of pleura, the first abdominal segment above, and a patch in the middle of the second, all covered with canary-yellow hair; face with dull white hair, with black intermixed; cheeks with white; vertex with black and whitish mixed; flagellum clear red beneath, except at base; frontal keel between the antennæ distinct but not high; clypeus with strong punctures, and a median smooth line; pleura, except the upper part, with dark fuscous hair; tegulæ ferruginous; wings with the basal half hyaline, the apical strongly reddened, with a purple (not at all green) lustre; legs with black or brown-black hair; sides of abdomen fringed with black hair; extreme apex with a little tuft of ferruginous hair. A species of the group of *M. modesta*, Smith, distinguished by its very broad form, the mixed light and dark hair on face, and the yellow patch on the second abdominal segment. From *M. anicula*, Vachal (which I have from Dr. Brauns), it is easily known by its broader form, and paler, strongly reddish wings.

Hab. Benguella; at flowers of a species of mint of the genus *Orthosiphon* (Wellman, 1473).

ON MOUNTING COLEOPTERA.

By H. F. FRYER, F.E.S.

It is with some hesitation I submit the following notes on mounting. To the old coleopterist there is probably nothing in them he does not know, and the practised hand will produce good work by many different methods; still, when I remember my early difficulties, and the awful objects I produced—some of which, species I have not met with again, still stare me in the face—and contrast this former state of things with the comparative ease with which a beetle is set up now, I am tempted to hope that some beginner may have his labours lightened by the hints given below, possibly some waverer confirmed in his faith, and, maybe, some collector induced to take up the study of this most fascinating order, members of which occur nearly everywhere, even in the most unlikely places, and which can be collected throughout the whole year.

Killing.—As far as my experience goes, the best method of killing specimens for mounting is by plunging them for a few seconds in water which is near the boiling point. An ordinary ringed stand, used in chemical work, a small spirit-lamp, and porcelain dish or crucible, is the most convenient apparatus, and is ready for use five minutes after the lamp is lighted.

The great advantage of this method is that the extinction of

vitality is immediate, so that species with retractile tendencies, such as *Saprinus*, *Byrrhus*, the *Rhynchophora*, and many others, which, when killed with laurel-leaves, cyanide, or ether, take some days to relax, and are never easy to set, when plunged in hot water die with their legs more or less extended, and if set at once do not present any great difficulties. If not set at once, *rigor mortis* sets in, and they must then be left from thirty-six to forty-eight hours until this has passed off. In this case they are best kept in a box, which also answers the purpose of a relaxing-box; at the bottom of one of the ordinary tin tobacco-boxes, which have a habit of accumulating in some houses, place a piece of the entomological peat, supplied by dealers in entomological apparatus; on this place two or three thicknesses of white blotting-paper, and saturate the whole with a weak solution of carbolic acid (1 in 40) to prevent the growth of mould; afterwards it can be simply damped with water when necessary. The specimens can be laid directly on the blotting-paper, but I find it more convenient to place them between the folds of an old pocket-handkerchief folded in book form and stitched at the back; the captures of different days and divers localities can then be more easily kept separate, and, moreover, can be successively dealt with as they become in a proper state of relaxation for setting.

Unfortunately the hot water method cannot be easily used in the field on a long day's excursion, when many species are taken, and as it is troublesome to keep separate the rapacious species, the insects must be killed on the spot, and the collector has his choice between laurel-leaves, cyanide of potassium, and possibly ether. After trying each, I have returned to the first-named, but the laurel-leaves must be finely shredded and renewed fairly often, though when stale they can be freshened up with a few drops of ether, the effect of which will last for a day. Laurel-leaves have the great advantage of keeping the insects relaxed for almost any length of time, and by using several bottles those from different localities can be kept separate without trouble. One disadvantage of laurel-leaves must be mentioned, and that is if the specimens are left for a lengthened period there is some danger of grease; but I have found that if the leaves are perfectly dry before they are used, this rarely occurs. It is hardly necessary to describe the well-known "beetle-bottle." I use the bottles in which the tabloids of *Cascara sagrada* are sold, and through the cork bore a hole with a cork-borer to take a piece of glass-tubing about 9 mm. in diameter—the larger the tube the cork will bear the better; the tube should project about $1\frac{3}{4}$ inches above and one inch below the cork, and should itself be fitted with a small cork made from the core from the boring, this small cork should be tied with fine twine to an elastic band round the neck of the bottle to prevent loss; it is only necessary then

to transfer this tubed cork from one bottle to another as occasion requires.

The Support.—Never stick a pin into any beetle if you can avoid it is a good maxim—in other words, mount all except the very largest species on cards; *Carabus*, *Dytiscus*, and *Lucanus* may, I suppose, be pinned, but I would rather have them on cards. Choose a thick card, as it does not buckle, and is firmer on the pin. Decide on about four standard sizes, and do not vary from them; a series well mounted on cards of the same size and at the same height on the pins is a thing of beauty, but on cards of different sizes and at different heights is a disgusting sight—I have many of them, I regret to say, put up in my inexperienced days.

Following the plan adopted in many museums, I have punches made of the four standard sizes, but these are not really necessary, as with a pair of compasses, a flat ruler, and a pencil, the cards can to all intents and purposes be cut the same size, but it is necessary to keep a card accurately ruled as a gauge.

One has now to decide whether to join the long card or short card brigade. A long card placed at the top of a long pin has, I think, the best appearance, but the extra room required is a great drawback, and unless one's cabinet is a forty-drawer one, I should advise the adoption of a short card placed at the top of a "point," *i. e.* a pin without a head, there is nothing then to interfere with the use of a powerful short focus lens. I use a Steinheil magnifying eight times, and one magnifying twelve, but with the former the characters of nearly all species except the smallest can be made out, and it is seldom necessary to employ a compound microscope.

(To be continued.)

DESCRIPTION OF A NEW SPECIES OF *MEGACHILE* FROM INDIA.

BY P. CAMERON.

Megachile nicevillii, sp. nov.

Black; the head and thorax covered with snow-white pubescence, the dorsal abdominal segments with similar pubescence, the scopa snow-white; wings hyaline, the nervures and stigma black; the first recurrent nervure received two-thirds of the length of the first transverse cubital nervure from the latter, the second clearly separated from the second transverse cubital. Mandibles bidentate, the apical tooth longer than it is wide at the base, gradually narrowed towards the apex, which is rounded; the second broad, bluntly rounded. ♀. Length, 7 mm.; breadth, 2 mm.

“India” is the only locality I have for this species.

Head, pro- and mesothorax closely, somewhat strongly, punctured; the post-scutellum and metanotum smooth, shining, bare. Head a little wider than the thorax; the clypeus wider than long, its apex transverse. The pubescence on the face and front is long and dense. Abdomen not quite so long as the head and thorax united, the basal four segments shining, distinctly but not very closely punctured, the last opaque, much more closely punctured, its apex with a broad white hair-band. Except on the under side of the tarsi, where it is tinged with rufous, the hair on the legs is white; the calcaria white, the posterior darker coloured than the others. The second abscissa of the radius is not much longer than the first.

Of the Indian species known to me the present comes nearest to *M. elfrona*, Cam., which may be known from it by the opaque, aciculated, almost punctured metanotum, by the first recurrent nervure being received nearer the transverse cubital, and by the rufous tarsi.

NOTES AND OBSERVATIONS.

TRICHOPTILUS PALUDUM Z. IN EAST DEVON. — Whilst collecting last September in East Devon, I took several specimens of a small plume-moth, which subsequent investigation proved to be *T. paludum*. It was flying in the afternoon over a boggy piece of ground, and its short flight of about a yard, from tuft to tuft of stunted heather, made it difficult to see. The most westerly record given in Barrett's ‘Lepidoptera’ is Dorset, but the species evidently exists over the borders of this county.—ARCHIBALD SHARPIN; Bedford, March 14th, 1908.

EXAMPLE OF PROTECTIVE MIMICRY IN MALE HEPIALUS HUMULI.—On July 16th, 1907, whilst walking in one of the lanes near here, I was struck by the large quantity of “Cuckoo spit” on the grass which was growing on the lane side, and was led to make a closer examination. To my surprise, I found that several of the white lumps that I had thought in the first instance to be “Cuckoo spit” were in reality males of *Hepialus humuli*, which were clinging to the grass stems with the wings folded along the body. This appears to me to be clearly a method of protection, and the idea is emphasized by the fact that the moth was only to be found where the “Cuckoo spit” was. This example of the protection of *H. humuli* was entirely new to me.—G. GIBSON-ROBERTSHAW; Gordon Bank House, Luddenden Foot S.O., Yorkshire.

LYCÆNA ZEPHYRUS var. LYCIDAS.—Referring to Mr. Prideaux' article in the March number of the ‘Entomologist,’ I note that the above butterfly was taken in a “slightly ragged” condition at Bérissal as early as June 15th. It may be interesting to mention that in 1886, about August 15th, I took two perfect specimens of the female on a high grassy plateau of the Gemmi just before commencing the ascent of the Pass. The altitude would be about the same as that of Bérissal; this capture therefore may be considered a striking

confirmation of the "very prolonged period of emergence" to which Mr. Prideaux refers. I was living at the time in Dresden, and on my return I took the two specimens out to Blasewitz for Dr. Staudinger's inspection. He pronounced them to be undoubted *Lycidas*, and said that the locality was to him a new one. I had taken a rather worn specimen of the male in the valley between Stalden and Brigue at the end of July the year before.—R. S. STANDEN, F.E.S.; Lindfield, Sussex, March 7th, 1908.

BIRD CHASED BY A BUTTERFLY.—One day while I was collecting in the Bered Woods at Durban I was much interested to see a specimen of *Papilio lyæus* in hot pursuit of a bird; he was chasing it in exactly the same manner that many of these big *Papilios* will sometimes chase away other butterflies from their own immediate neighbourhood, and the bird, which was about the size of a large blackbird, was flying rapidly before his pursuer, showing every symptom of fear and trepidation, while the butterfly continued to pursue the intruder for some distance, before returning to his former perch. Most collectors will doubtless have occasionally seen a bird pursuing a butterfly (though generally without effecting its capture), but I should be interested to know if anyone has ever before observed the relative positions reversed.—(Miss) M. E. FOUNTAINE, F.E.S.; Durban, Natal, December, 1907.

SYMPETRUM VULGATUM.—Referring to the inquiry (*antea*, p. 39) relating to *Sympetrum vulgatum*: whilst I cannot, of course, give any information as to the locality from which Mr. Harrison obtained the specimen referred to, I can report that he was a most reliable man, and accomplished some good natural history work in this district. In 1835 he took an active part in connection with the British Association Meeting at Hull, and we have many evidences in this museum of his reliability.—T. SHEPPARD; the Municipal Museum, Hull, March 24th, 1908.

ENTOMOLOGICAL SOCIETY OF LONDON.—The First Commissioner of H. M. Works having kindly placed the Theatre, Great Hall, and other rooms of the Civil Service Commission at Burlington Gardens at the disposal of the Society, the Conversazione will be held there on the evening of Friday, May 15th, and not as previously announced to Fellows. Full particulars will be published during the current month, and intending exhibitors are requested to communicate with the Honorary Secretary, H. Rowland-Brown, 11, Chandos Street, Cavendish Square, W.

CAPTURES AND FIELD REPORTS.

EUPITHECIA INNOTATA NOT IN WORCESTERSHIRE.—My note (Entom. xl. p. 40) on the above insect having been taken by me here having been questioned by Mr. Eustace Bankes, I submitted the insect to his kind inspection. He tells me that although my specimen might be referred equally well either to *innotata* or *fraxinata* (assuming that these are distinct species, which is open to argument),

the occurrence of the former so far inland is decidedly improbable, and the proximity of an ash tree to my house further justifies the assumption that the individual is *fraxinata*. I have therefore placed it accordingly.—ARCHIBALD DAY; The Vicarage, Malvern Links, March 22nd, 1908.

NOTES FROM THE NORTH-WEST (continued from p. 66).—On the *davus* locality in the Delamere district we counted eight rather worn specimens of this butterfly on the 20th. The ground is now protected by gamekeepers, but whether or not their advent will restore the butterfly to its former numbers remains to be seen. Other heath and fir insects were observed as *L. ægon* (not so plentiful as in 1906), *Nemeophila russula*, *Ematurga atomaria*, *Bupalus piniaria*, *Aspilates strigillaria*, *Macaria liturata* (with the dark form *nigrofulvata*), *Crambus margaritellus*, and *Pleurota bicostella*. *V. urticæ* and *Epinephele ianira* were numerous and fresh, and many *L. quercus* males were dashing about. For the first time in my experience of the Delamere district I found a larva of *Saturnia carpinii*.

On July 21st seven males and one female of *Scodion belgaria* were taken on the Denbighshire hills. The remainder of the month was made up of cool, unsettled weather, and "the coldest July on record" ended on the 31st.

August 1st was a fine day in Denbighshire, and fairly warm and sunny. Starting in the morning with Mr. J. Thompson, we had an enjoyable ramble of some twenty miles over the mountains from Wrexham to Llangollen. A male *L. quercus* was seen—attracted by a perforated zinc box which had contained a virgin female. A very dilapidated female, which had laid its eggs, was picked off the heather and then set at liberty. Some specimens of a dull form of *Agrotis porphyrea* (*strigula*) were netted. Other Lepidoptera were pale and type forms of *Larentia didymata*, *Crambus culmellus*, *Aphelia osseana*, and the pretty little tortrix *Eupacilia angustana*. A *Scoparia* was also common on the heather, and as I had taken the same species in Delamere Forest in July, and on Arnside Knott, North Lancashire, in August, 1906, I sent specimens to Mr. Eustace R. Bankes, who kindly identified them as *S. ambigualis*. A large grey spider (*Epeira diademata*) with brown, blotched markings was taken from its geometrical mesh. I kept it alive on a piece of heath for three months in a glass jar, where it at once constructed another mesh regardless of the fact that no flies could enter through the net covering. It was supplied daily with house flies, and it was interesting to note that it only seized its prey when the latter struggled in the mesh. Other flies often brushed close past, and even touched the spider, but were never seized. In fact, the whole was an exhibition of how instinct ends and reason never begins. Its power of sight did not appear to extend beyond an inch or two, and the sense of hearing seemed supplanted by a keen sense of vibration. At the end of the three months I handed it over to a member of our "Society of Natural Science, Literature and Art," which, by the way, was founded by Charles Kingsley, and now numbers over a thousand members.

As we sat eating our lunch on the top of Minera Mountain it was

interesting to watch "Daddy Long Leg" females (*Tipula oleracea*) depositing their eggs at the roots of the short, carpet-like grass. Their bodies, with their ovipositors, were kept vertically bobbing up and down, and the long legs were useful in keeping the wings clear of the grass.

A few larvæ of *S. carpinii* were boxed, and three unknown others, apple-green, with a silvery-white spiracular line, a thinner silvery-white dorsal line, segment divisions white-yellow—altogether very suggestive of the genus *Polia*. Some nettles which a fortnight ago had feasted swarms of *V. io* caterpillars were found deserted, but as usual not a chrysalis was to be seen anywhere.

Descending into the lovely Vale of Llangollen at dusk, and past the Eglwysig Rocks, *viz.* the *ecclesiastical rocks*, because belonging to the dismantled Abbey of the Vale of the Cross (Abbey Crucis) hardly—these rocks are famous in the history of *A. ashworthii* as the place of discovery in 1853, by Mr. Joseph Ashworth—we netted *Cidaria aversata*, including the dark-banded form *C. fulvata*, *Camptogramma bilineata*; and *Hypena proboscidalis* was such a nuisance that darkness was almost welcomed as putting an end to the annoyance.

On the hills in Denbighshire, where the carboniferous limestone crops out, *L. agestis* was just appearing on August 10th. Two *L. alexis* were netted, and numbers of worn *E. ianira* and *C. pamphilus* were observed. *Anaitis plagiata* and *E. mensuraria* were plentiful among the short furze and heather. A specimen of *Hecatera serena* was taken at rest on a stone wall. The usual breakdown in August weather took place on the 12th, and from that date to the end of the month the time at my disposal was chiefly spent in looking for larvæ. What I take to be caterpillars of *H. serena* were common locally near Chester, on flowers of hawkweed and cats'-ear; and numerous *Dicranura vinula*, *Smerinthus populi*, and *S. ocellatus* were observed on poplars or willows. Since a great deal of the ground on which the willows grew is under water throughout the winter, the pupæ of the last-mentioned species must consequently be drowned—another case of instinct *versus* reason. From the 19th to the 24th, the mean daily maximum temperature in London was only sixty-three degrees—nine degrees short of what is normally due in August. The low general temperature of the month, with frequent rains, sent thousands home from the seaside.

Autumn opened on September 1st, with a fine, calm, sunny day, but the remainder of the week was one of winter and rain-storms from the north-west. Two degrees of frost were registered near Chester on the 4th, instead of the temperature of last year which approached ninety degrees. Snow fell in North Wales and in Scotland. The Snowdonian Range was snow-capped, and Ben Nevis was white to a distance below the summit of 2000 feet. Entomology seemed at an end for the season, when, contrary to expectation, the remaining three weeks of the month were, for the British Isles, an Indian summer. But, in a favoured haunt, where there had been scores of *L. alexis* in 1906, there were only four males and one female observed of the autumn brood. At ten o'clock on the night of the 8th, I came upon a small caddis-fly clearing a bud of a Gloire de Dijon

rose of aphides. In a few minutes every aphid was devoured except a male, which, upon being attacked, took to flight, as also did the caddis.

Moths appeared again at the electric lamps, and on the 16th I got a male and female *A. agathina*. Curiously enough this was one of the few unrepresented species in my collection of Macro-Lepidoptera, and I was uncertain of my captures until they were confirmed by Mr. South.

The 25th was the warmest day of the season since May 11th, the thermometer registering eighty degrees in the shade and one hundred and eighteen degrees in the sun. The month closed with a falling barometer. It was interesting to note that while the United Kingdom was enjoying an Indian summer, Newfoundland, Spain, Portugal, and France were smitten by storms of terrific violence. The tornado with its downpour reached as far south as Casa Blanca on the Moorish coast of Africa, the French camp being wrecked on the 26th.

Very little entomology could be done in October. As predicted by the barometer the 1st was a day of rain, but, from that date to the 6th, the weather improved and it was fine, warm and sunny on the whole. *A propos* of spiders it was interesting to read that the airship "Nulli Secundus" met with "cobwebs, high up" in its ascent on the 5th, and that the balloon was afterwards found to be covered with them. I am not aware that the appeal to scientists for an explanation met with a response, but the cobwebs were doubtless gossamers or spider's threads, which float in the air and, especially in a dry atmosphere, rise to a considerable height, travel long distances on the breeze and distribute the spiders' young. A similar case of insect distribution is seen in the Woolly Aphis (*Schizoneura lanigera*) on apple trees, with its white cottony secretion enabling the young Aphides to travel with the winds from tree to tree. The lowest London temperature on October 8th was forty-six degrees—only one degree warmer than Lapland, and the remainder of the month was unusually cold and wet. The usual autumn moths—*Hydræcia micacea*, *Anhocelis pistacina*, *Phlogophora meticulosa*, *Aporophyla lutulenta*, *A. nigra*, *P. gamma*, *Ennomos tiliaria*, *E. fuscantaria*, *Hybernia defoliaria*, *Cheimatobia brumata*, with an occasional *Pæcilocampa populi*, *Cirrhædia xerampelina*, and *Dasy-polia templi*—appeared at the electric lamps, but in diminished numbers.

November is often an enjoyable month, but calm, sunny days were absent in 1907. On the 25th snow fell in Cumberland, North Wales, Shropshire, and Lincolnshire. Larvæ of *Boarmia repandata* began hybernating as early as the 20th of October. They do not move from the position taken up under dead leaves, &c., until early spring. Larvæ of *A. nebulosa*, on the contrary, often woke up in the inclement December, and indeed throughout the winter, wandered about their cages, and even ate a little dock.—J. ARKLE; Chester.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 4th, 1908.*—Mr. C. O. Waterhouse, President, in the chair.—Major E. F. Beecher, of 2, Berkeley Villas, Pittsville, Cheltenham; the Rev. K. St. Aubyn Rogers, M.A., of Rabai, Mombasa, British East Africa; and Mr. Claude Rippon, M.A., of 28, Walton Street, Oxford, were elected Fellows of the Society.—The decease of Mr. Herbert Goss, F.L.S., for many years a Secretary of the Society, was announced in a sympathetic speech by the President.—Mr. F. B. Jennings exhibited a specimen of the weevil *Phyllobius maculicornis*, Germ., retaining both the “false” mandibles, and another in which one of them is intact, both from Enfield; also a single example of *P. urticae*, De G., from Cheshunt, retaining one of these appendages, the particular point of interest in connection with these examples being that the “false mandibles” were toothed in the centre; also a remarkable specimen of the common Chrysomelid beetle, *Sermyla halensis*, L., from Deal, showing unusual coloration of the elytra, which were blue and coppery-red, instead of bright green; and on behalf of Mr. C. J. Pool, a specimen of *Otiorrhynchus tenebricosus*, Herbst, from Newport, Isle of Wight, and of *Barynotus obscurus*, F., from Galway, Ireland; in the first of which both the pupal mandibles were toothed, and not in the second.—Mr. H. St. J. Donisthorpe brought for exhibition *Otiorrhynchus sulcatus*, *Polydrusus sericeus*, and *Osminus bohemannii* with pupal mandibles. The *Otiorrhynchus* was dug up in its pupal cell at Oakham in 1905.—The Rev. G. Wheeler showed a case containing specimens of Melitæid butterflies taken by him at Reazzino in Tessin, near Bellinzona, which he had identified with Assmann’s *Melitæa aurelia* var. *britomartis*, they being absolutely identical with the specimens so labelled in the Swiss national collections at Berne. The close affinity with *M. dictynna* made separation superficially very difficult, and until all forms were reared from the ovum it would be impossible to determine whether *britomartis* constituted a separate species or not.—The following papers were communicated:—“Descriptions of New Species of Lepidoptera-Heterocera from South-East of Brazil,” by H. Dukinfield Jones, F.E.S.; “*Erebia lefebvrei* and *Lycena pyrenaica*,” by Dr. T. A. Chapman, M.D., F.Z.S.; “A Contribution to the Classification of the Coleopterous Family Dynastidæ,” by Gilbert J. Arrow, F.E.S.; “Hymenoptera-Aculeata Collected in Algeria by the Rev. A. E. Eaton, M.A., F.Z.S., and the Rev. F. D. Morice, M.A. Part III., *Anthropila*,” by Edward Saunders, F.R.S.

At the Special General Meeting adjourned from February 5th, the proposal to raise the Life Composition from £15 15s. to £21 was rejected by a majority of three votes.—H. ROWLAND-BROWN, M.A., *Hon. Secretary.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 13th, 1908.*—Mr. A. Sich, F.E.S., President, in the chair.—Mr. R. Adkin exhibited a bred series of *Anticlea rubidata* from Devonshire, and called attention to the pale olive-brown forms

as not occurring elsewhere.—Mr. South, a bred series of *Larentia olivata* from Torquay, two of which emerged on June 4th, 1907.—Mr. Tonge, a female example of *Melanippe fluctuata* taken on February 12th at Portsmouth, and a female *Hybernia rupicaprariva*, and called attention to the peculiar droop of the wings in its resting attitude.—Mr. Step, a butterfly set up between two pieces of glass, for use by students of art schools.—Mr. Rayward, the hibernating larva of *Aricia agestis* (*Lycæna astrarche*).—Mr. Newman, a varied series of *Nemeophila plantaginis* from Aberdeen, an extremely light *Mellinia gilvago*, two *Hylophila prasinana* with very indistinct lines, a rayed variety of *Melanippe sociata*, and a broad-banded form of *Mesotype virgata* (*lineolata*).—Mr. Colthrup, species taken at ivy in the New Forest in 1907.—Mr. Turner, eight species of Pyralidæ taken in Canada last year by Mr. L. B. Prout, including *Evergestis straminealis*, and read notes on the forms and the distribution of each. He also showed examples of several British species of Pyralidæ from Syria, including *Pyralis costalis*.—Dr. Hodgson, a long series of *Agriades* (*Lycæna*) *bellargus*, showing the colour variation obtainable in the species. They were selected from 1904 to 1907 in various parts of the North and South Downs. He pointed out the five distinct shades of blue, and gave notes on the markings and on the aberrations obtained.—Mr. Fremlin read a paper entitled "The Effect of Physical and Chemical Agencies on Lepidoptera, being the Results of Experiments made in 1906-7," and a discussion took place.

February 27th, 1908.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Edwards exhibited specimens of *Papilio lampsacus* and the rare *P. priapus* from Java.—Mr. Rayward, the ova of *Miselia oxyacanthæ* in situ on twigs of hawthorn. All were solitary, except in one instance of two ova.—Mr. Pratt, a larva of *Geometra vernaria* which had passed two winters in that stage.—Mr. Newman, living melanic females of *Hybernia leucophaæria* from Bexley, and a bred melanic form of *Larentia multistrigaria* from Huddersfield.—Mr. Sich, a transparent m.m. and c.m. measure for obtaining the alar expanse of insects.—The rest of the evening was spent in the exhibition of lantern slides, among which were the following entomological subjects:—Mr. Tonge, slides of lepidopterous ova, larvæ, cocoons, pupæ, and imagines; Mr. Main, slides showing the osmateria of *P. machaon*, and various larvæ and pupæ.—H. J. TURNER, *Hon. Rep. Secretary*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—February 18th, 1908.—Annual Meeting.—At the nineteenth Annual Meeting of this Society it was resolved to dissolve the Birmingham Entomological Society, and to hand over its assets, &c., to the Birmingham Natural History and Philosophical Society, with the idea of forming an entomological section of that Society.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—February 4th, 1908. Mr. L. W. Newman exhibited *Halias prasinana*, with inner line on fore wings obsolete, and outer nearly so; also *Eubolia lineolata*, with white band very broad and much accentuated and extended round hind wings.

March 3rd.—Mr. S. J. Bell, *Gnophos obscurata* from various localities, including examples from North Cornwall (near Bude), as dark as the New Forest form.—Dr. T. A. Chapman, microscope slides of ova of *Iodis vernaria*, showing that the surface consisted of a collection of hexagonal cells each with a central knob. *A propos* of this exhibit Mr. L. W. Newman stated that he had frequently noticed a sweet scent when opening boxes containing ova of this species.—Mr. A. W. Mera, *G. obscurata*, a pale speckled form from Freshwater.—Mr. V. E. Shaw, *G. obscurata* from many localities, including sandy-coloured specimens from Babbicombe.

March 17th.—Dr. H. C. Phillips, a specimen of *Acronycta aceris*, darker than the London form of *A. psi*, from Kensington Gardens; also from same locality a series of *Ennomos angularia*, including female with the two lines on fore wings accentuated and close together; long series of *Cidaria immanata* and *C. russata* were shown by many members, these species being the subject of the paper to be read by Mr. L. B. Prout; the latter's series included melanic *C. russata*, from Wolverhampton, and specimens from America attributed to this species but proved by the genitalia to be distinct.—*Hydræcia nictitans* and *paludis*. Rev. C. R. N. Burrows exhibited drawings of the genitalia of *nictitans* and of *paludis*, generally known as the marsh form of *nictitans*. The exhibitor claimed that these showed differences in structure which entitled *paludis* to specific rank.—S. J. BELL, *Hon. Sec.*

THE ENTOMOLOGICAL CLUB.—A meeting was held at Wellfield, Lingards Road, Lewisham, on March 19th, 1908, Mr. Robert Adkin in the chair. Other members present were Messrs. H. St. J. K. Donisthorpe, T. W. Hall, and G. T. Porritt. There were also eleven other guests, among whom were three hon. members—Messrs. H. Rowland-Brown, A. Sich, and E. A. Smith. The chairman announced that, in consequence of the regrettable death of Mr. A. Chitty, a vacancy occurred in the membership, and that this should be filled up at the next meeting. Mr. Donisthorpe proposed Mr. Rowland-Brown as a member of the Club, and this was seconded by Mr. Porritt. The nomination to be brought forward at the next meeting.—RICHARD SOUTH, *Hon. Sec.*

RECENT LITERATURE.

Additions to the Wild Fauna and Flora of the Royal Botanic Gardens, Kew: VI. (Bulletin of Miscellaneous Information, No. 10, 1907).

The present short list comprises the Orthoptera and Neuroptera, and a few Hymenoptera and Coleoptera, submitted to Mr. W. J. Lucas, B.A., since the publication of 'Bulletin, Additional Series V.' The list is illustrated by a plate of cockroaches—*Nauphæta brazzæ*, *N. cinera*, *Blatta orientalis*, and *Leucophæa surinamensis*. The list is followed by a note by Mr. Watson on the harm done by cockroaches at Kew.

NEWLY-HATCHED LARVA OF PAPILIO HOMERUS. · 124.

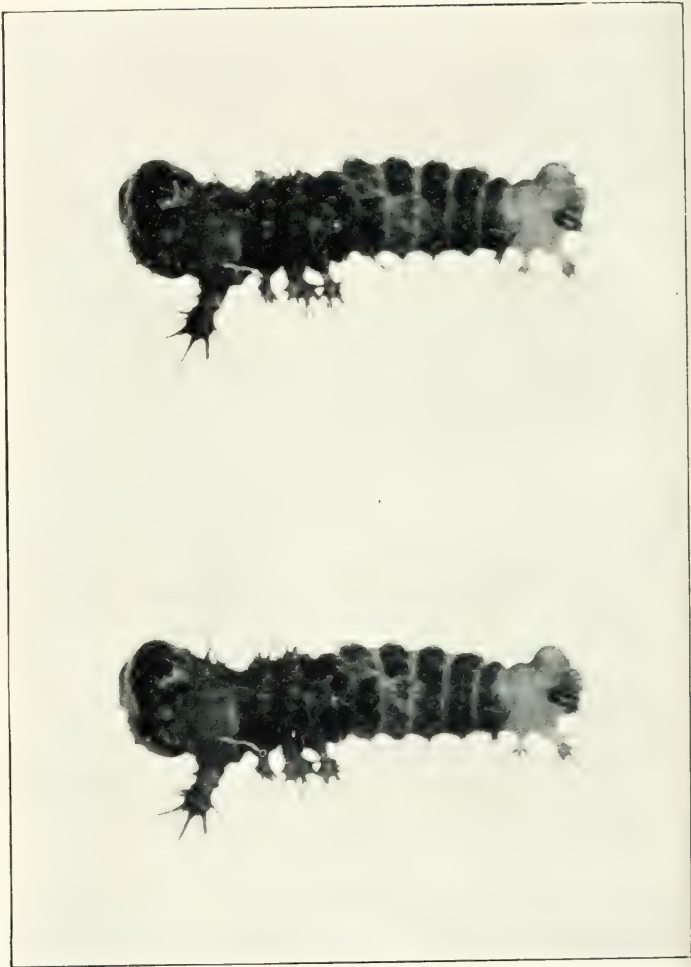


Photo A. E. Tonge

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ON THE EGG AND FIRST-STAGE LARVA OF *PAPILIO HOMERUS*, FABR.

BY T. A. CHAPMAN, F.E.S.

(PLATES III.-V.)

THE egg and young larva of this butterfly are described by Gosse in the Proc. Ent. Soc. Lond. for 1879, p. lv, and the full-grown larva and pupa in the 'Transactions' for 1894, p. 409, but no figures at any larval stage are, so far as I know, available.

It is, therefore, with some satisfaction that I am able to give a figure of the newly-hatched larva from stereoscopic photographs by Mr. A. E. Tonge, F.E.S. This larva is not so eccentric as a young *Papilio* as it was regarded by Gosse. The full-grown larva, like that of most *Papilios*, is without hairs or spines; Gosse's remarks were no doubt due to expecting the newly-hatched and full-grown larva to be similar.

This young larva would be very remarkable were it that of a *Papilio* larva in the last stage. Though it is, so far as I know, very unusual in the high pillars on which the bristles are mounted, it is not essentially very different from the first-stage larva of, say, *cresphontes*, as figured by Scudder.

Mr. G. R. Baldock, F.E.S., handed me some eggs of *Papilio homerus*; they were found in the envelope with a female *P. homerus* in paper, attached to the end of the abdomen. The datum on the envelope was June 7th, Mooretown, Jamaica. Several of the eggs contained dead larvæ, which had eaten holes in the shells, but had not succeeded in escaping. There was one larva dead and shrivelled that was free.

The eggs were more or less fastened together and smeared with a glutinous substance, most abundant about the base of the egg. I imagine that if the eggs had been laid naturally it would

have been confined to the base of the egg, and was, in fact, the cement for fastening the egg to a leaf, or whatever is the proper place on which the butterfly fixes it. The eggs being laid in a bunch in a confined space, the result is the general dissemination of the cement. The eggs are almost exactly spherical, except for a flat basal area, diminishing the height of the egg by about one-sixth; an egg 1.8 mm. across is 1.5 in. high. The eggshells are whitish and slightly rough, with no special structure; this is, however, probably due to the cement smeared over them. When damp they are transparent, and the larva inside, when alive and filling the shell, was no doubt quite visible inside it, coiled up. The egg is a very large one, the diameter being 1.8 to 1.9 mm.

In a mounted portion of the shell the micropyle is a little patch of very small cells, with centrally eight black dots (pores). The blackness of the dots is merely a refractive effect, as the focus can be altered so as to make them brilliant points. In the immediate neighbourhood of the dots the cells are approximately hexagonal and 0.01 mm. in diameter; at 0.1 from the centre they are about 0.015; at 0.15 they are radially elongated, about 0.015 across and 0.03 long; at .25 from the centre they are about 0.04 long. One or two can be barely made out at 0.3 mm. from centre, about 0.03 mm. wide and 0.06 long; beyond this no traces of cellular structure can be seen. The shell generally is finely granular. The appearance conveys to me—I cannot quite say how—a suspicion that these granules belong to an adventitious coat (of cement?), but this can hardly be the case regarding their very uniform size and general distribution; each granule occupies a space of about 0.0025 mm. across. The result of certain scratchings and scrapings of another portion of egg-shell leads me to conclude that these granules are adventitious, but not from misplaced cement; possibly they are some portion of embryonic membrane, as they appear to be rather on the inner surface of the shell.

P. homerus larva at hatching is 5.0 mm. long, head 1.2 mm. wide; head dark brown, dorsum fuscous-brown to seventh abdominal segment; sides of thorax pale, with slight fuscous shades, second to seventh abdominal segments rather lighter than first and thoracic dorsum; these segments are all similarly coloured and marked. The eighth, ninth, and tenth segments are colourless, and notwithstanding the other colourless areas stand out as conspicuously white. The most notable feature of the larva, however, is the groups of hairs raised on great bosses—almost horns on the prothorax—and less ones on the three following segments, and on the eighth and ninth abdominal.

The dark dorsum results from a series of dark lozenges towards posterior border of segments, especially large on second thoracic, and of arched marks on each side of these, and on

some segments meeting in front of them. There is a rather paler stripe just below these (subdorsal) containing one dark mark. Laterally the dark area from subdorsal to low subspiracular is partially broken by light markings into three parallel stripes, and these a little broken on each segment.

The brown head has four ocelli in a curve, with convexity forwards, and one (making five) about the centre of the curve behind. The base of antenna is pale, as well as the soft portions of the mouth-parts. There is a paler area at the vertex laterally. The first antennal joint is an extremely narrow line of brown chitin, easily overlooked. The second is conical, flat at each end, nearly half as long again as broad at the base, more than twice that of apex. It carries on front side a short thick hair, and close to or on the end what must be called a hair, but is a broad thick process, little longer than broad; at end is a third joint, a short process as broad as long, with several hairs or sensitive papillæ at end; also on second joint, and beside this, are two conical (jointed at base) papillæ, and one minute hair. The labrum is 0.5 mm. wide, deeply notched so as to be 0.22 mm. long (antero-posteriorly) at ends, 0.17 in the middle. It carries outside five bristles (on each side), longest nearly 0.1 mm. long; inside it has on each side one long median hair and a row of six very thick bristles (0.05 mm. long) round the margin of the lateral rounded flap. The inner surface and membrane behind is clothed with abundant, minute, sharp, hair-like skin-points, their apices directed backwards, *i. e.* away from the margin.

The jaws are of rather square outline, about 0.35 mm., with three large rounded teeth, three or four minute internal and six nearly as small external to them. All these teeth have finely crenated margins. On the external margin is a short but rather sharp tooth. The maxilla has a general resemblance to a larval leg. The first joint narrow externally, broader internally, with one long and one short bristle. Basal to this first joint is a plate with two or three hairs. The second joint is broad externally, narrowing (at least its chitinous covering) to a point internally, with a long bristle here. Beside the terminal joint is a rounded chitinous boss carrying three strong bristles and two small mammillæ, each with a terminal mammillula. The third joint is a little smaller than, of much the same shape and proportions as, the second antennal joint. It carries, again, a fourth joint (but no hairs), of about half its own length, and this has at end several mammillæ, one at least with a mammillula. The visible portion of the labium is triangular (nearly equilateral), with sides 0.2 mm. long; two-thirds of this (in length) seems to be in one piece. The apical third is formed of two side and one central piece. Each side-piece has a palp, the first joint about 0.05 mm. long and a quarter of this width; at end of this there is a long (0.02) conical sharp-ended piece, apparently jointed

centrally. The middle portion is a spinneret with broad base, the details of structure not easy to see. There are on the head a number of bristles, seventeen or eighteen on each side, and eight or so on the clypeus, besides a number of transparent points that might be called lenticles; all these have their definite positions impossible to describe even with unlimited prolixity. The osmateria are well-developed, two eversible processes apparently usually directed forwards, about 0.6 mm. long (possibly more if fully stretched).

The arrangement of the great prominences armed with hairs will be best appreciated by the aid of Mr. Tonge's excellent stereoscopic portrait of the larva. These prominences are a very large pair on the prothorax, which appear to represent the pre-spiracular group of tubercles, but may belong to the prothoracic plate, the spiracles being behind them and the prothoracic plate between. They have about fourteen hairs radiating in all directions on the rounded summit, and eight or ten smaller on the somewhat narrower neck. The hairs are about 0.35 mm. long, broad at the base, and tapering in a regular conical manner to the fairly sharp tip; they are quite smooth and have a slight curvature; some of those on posterior segments are a good deal curved. The prothoracic plate carries smaller hairs; on each side is a hair, rather behind the middle and near the dorsal line, another further out near the anterior margin, and a group of three behind and a little further out than this. At the lower front margin of the great column is a boss with five or six hairs. This may be the pre-spiracular group; if so, the large wart belongs to the prothoracic plate. The specimens are not very mature, and an appearance of the plate being continuous with the chitinous base of the wart is noticed, but may be deceptive.

On the second thoracic is a single hair on each side of the middle line, then a large wart, pillar, or horn of brown chitin carrying seven hairs, followed by another almost identical with six hairs; then a small wart with two hairs, and a separate hair just behind it; then two more slender hairs close together, those apparently so often present just above the legs. On meta-thorax the dorsal hair is larger than on second thoracic, the first chitinous wart is very large with nine hairs, the next rather smaller with eight, then a low wart with four hairs, and then two at base of legs. The legs carry a number of small hairs on their bases, and several on each joint. The claw is sharply bent, and has a very sharp point.

On the first abdominal segment the dorsal hair (i. ?) is still single, but the base is prolonged into a conical stem, from the end of which the hair arises. Then follows a large globular wart on a narrower neck, with nine or ten hairs, then a single hair (iii.) above spiracle. On a subspiracular flange two hairs (iv. and v.), the anterior the lower; on a lower flange four fine

hairs; a little group of three below this, and one ventral hair (VIII. ?); the hairs below are all much smaller and finer than those on the bosses. On the second abdominal i. is a small sessile hair, ii. a low wart with five or six hairs (of which two or three are large but less than those on the great warts), iii. single, iv. and v. as on first abdominal; but in place of the little group of three hairs vii. and the ventral hair is an oval area, with about a dozen fine hairs, and looking as regards size and position much like a proleg. Third, fourth, fifth, and sixth abdominal are much the same; the hairs of wart ii., however, rather smaller and finer, and prolegs in place of the ventral patch. On seventh wart ii. is a little larger; on eighth it is larger (though less than the large ones in four), and carries six rather long curved hairs, iii. iv. and v. single hairs; i. is present on ninth abdominal, but ii. is again a very high large wart, with some fourteen hairs; on tenth are again two warts, lower and with shorter hairs to the number of about a dozen on each; they are two warts, not merely a terminal fringe. There is a group of five hairs further out on tenth (or on ninth ?); there are also five or six hairs near eighth spiracle, but their homology not easy to determine. The prolegs are very large, nearly 0.2 mm. across, on short thick pedicels, the outer front of which is armed with about twenty-five short thick hairs, with one on inner posterior margin. The crochets are arranged in an oval, the long axis of which is directed outwards and backwards. The oval is, however, broken at each end, so that there is an inner posterior set of hooks of about twenty-four in number, and an outer anterior numbering about nineteen or twenty; the inner are the larger as well as the more numerous. Each set dwindles in size of hooks at each end; when collapsed the two sides meet along the axis of the oval. The claspers are in one row of fifty to sixty hooks, forming about three-fourths of a complete circle or ellipse. The spiracles are small brown circles, with lines radiating to the centre; the prothoracic one is slightly oval; longest axis about 0.04 mm.

The general surface has an extremely fine dotted texture.

DESCRIPTIONS OF PLATES III.-V.

PLATE III.—A stereoscopic picture of the newly-hatched larva, $\times 12\frac{1}{2}$. Photo by A. E. Tonge, F.E.S.

PLATE IV.—Egg-shells of *P. homerus*, $\times 10$. Photo by A. E. Tonge.

PLATE V. — Micropyle of the egg of *P. homerus*, $\times 250$. Photo by F. N. Clark.

The eggs are only empty shells, and with holes in them made by the larvæ; one or two are, however, but little deformed. The upper one is placed on its side to show the flattening of the lower surface. The stereoscopic pictures may be readily examined by means of any of the stereoscopes that are open below, of which there are several forms to be had very cheaply.

LIFE-HISTORY OF *HESPERIA PANISCUS*, F., =
PALÆMON, PALLAS; Staud. Cat.

By W. A. ROLLASON.

IN preparation for a new and completely illustrated work on the larvæ and pupæ of the British Macro-lepidoptera the following life-history has been prepared, and as but few entomologists have had the opportunity of rearing the species and at the same time drawing and describing both larva and pupa, I have thought that it would interest many students in the science to read the descriptions I have been enabled to draw up. Through the kindness of fellow-workers opportunity has since been afforded me of comparing the previously written and excellent descriptions of Messrs. Buckler, Hellins, and Frohawk, and I find my description of the larva in various stages is of much fuller detail in nearly all respects, and especially in that of the larva after hibernation. Again, also with the pupa I have a much more detailed description of its form and colour, notably in the transitional stages of colour from day to day for four or five days before emergence of imago, and which latter process, including dehiscence, I had the gratification of witnessing and describing in detail. The following is my complete record:—On June 15th, 1906, my esteemed and valued correspondent, the Rev. Gilbert H. Raynor, sent me ova from a wild Wansford female. The ovum is shining, pearly, and of a warm whitish-grey colour, inclining in some instances to bluish or yellowish. They were laid singly on fine grass stems. These hatched on June 21st, 1906, the young larvæ emerging by eating away the crown. They were white, with dull surface, and having a very large perfectly black shining head, the anterior margin of dorsal plate on second segment being also shining black. The young larvæ were supplied with tender leaves of *Brachypodium sylvaticum*, and kept indoors for four days, after which they were sleeved out in my garden on a growing plant of same. At this early stage they commenced to spin edges of leaves together. Until August 13th they were not disturbed, when on opening the sleeve I found five larvæ about five-eighths of an inch long, and they, having eaten nearly all the leaves of the food-plant, were walking about the muslin sleeve. They rest in tubular retreats formed by spinning together, though not closely, the edges of the leaves for about an inch. Their method of feeding is to practically remain in their retreat, eating away the leaf above and below to a very thin strip, and only so far as they can reach. When eaten below, this naturally causes the retreat to fall and hang. When food is again required the larva timidly leaves the retreat and hastens to make a similar one on another leaf; feeding again as before described. The larvæ were

now of a greyish-blue-green ground-colour, some being yellowish-green; pale brownish heads, reticulated with very dark brown on top, and appearing roughened; ocelli black, as also posterior edges of cheeks; a dark spot on top of second segment, and a dark dot immediately above spiracle on this segment. These dark markings appear to have taken the place of the shining black plate on anterior margin of second segment which were on the larvæ when they emerged from the egg. There is also a dark brown longitudinal blotch on top of anal flap. A dark medio-dorsal greenish stripe is continuous throughout to blotch on anal flap, and this stripe is edged on either side with lighter. There is a conspicuous sub-dorsal pale whitish-green band, edged above and below with dark green; spiracles roundish and of a pale rust-colour; legs brownish and semi-transparent; claspers and ventral area of uniform ground-colour. Larvæ cylindrical, with a little taper to both extremities, *and the second segment is remarkably small*; head oval and full; segmental divisions clearly defined; larva bears numerous minute hairs generally distributed. Immediately above spiracles is a band of darker green than ground; anal flap rather pointed and rounded; claspers fairly large; legs moderate size. When out of retreat and disturbed larvæ fall to the ground and curl into a ring, sometimes remaining a considerable time in this position without any movement. Having been transferred to a freshly potted food-plant, they were not disturbed again until September 7th, when the sleeve was again opened, and the larvæ being found to be full-fed, a careful drawing was made. They were about one inch long and in many ways quite different to the stage last described, the most notable being the absence of the brown head with its darker markings, and the absence of any dark on the anal flap or anterior margin of second segment. Head oval and full; general form cylindrical, with taper to both extremities; *second segment remarkably small*; segmental divisions clearly defined; spiracles roundish; legs and claspers rather small; anal flap pointed and rounded, and a little concave on dorsal area; segments three and four are transversely wrinkled, and segments five to eleven are each transversely wrinkled in *five* rings, the anterior being much the widest, the second smaller, and the last three smaller and of uniform width; segment twelve is transversely wrinkled in *four* rings. Markings: Surface dull and of a uniform greyish-blue-green ground-colour, sometimes the tinge inclining to yellowish-green. They have a somewhat velvety-looking appearance, probably due to being clothed with very short and minute hair. Head pale brownish or pinkish-green with black ocelli, and a thin dark line down centre; clypeus of ground-colour; labrum and mandibles pale brownish or pinkish, the mandibles being dark brown at centre. There is a pulsating medio-dorsal stripe of darker green than

ground, and this is edged on either side with a paler line than ground. A conspicuous sub-dorsal stripe of pale greenish-white, sometimes appearing yellowish, is continuous throughout, and terminates on anal flap. This stripe is edged above and below with a band of darker green than ground, and this darker green is again edged with lighter than ground. The spiracular line is light yellowish-green, but not conspicuous. On it are situated the spiracles, which are of a rusty tinge edged with lighter. The spiracular line is edged above with a green band of darker colour than ground. There is a subspiracular skinfold, and this with ventral area is of uniform ground-colour; legs and claspers of uniform ground-colour. There are a few very inconspicuous greyish-brown dots in region of spiracles, and very fine short hairs generally distributed over larva. When walking, larva has that trembling movement of anterior segments so characteristic of geometer larvæ, and is very lethargic in its movements. Larvæ were fed up throughout *outdoors* on a growing plant of *Brachypodium sylvaticum*. They were brought indoors early in November, when five larvæ had formed hybernacula, about an inch long, by binding together edges of a leaf with silken threads, one having attached itself to both a leaf and the muslin. They were kept in a cold room all the winter. On Feb. 10th, 1907, they were removed, together with their hybernacula, into a smaller pot, which was covered by a glass cylinder with muslin across top. This disturbance caused one larva to come out of its hybernaculum; this was the one attached to the muslin—it wandered about in a lethargic manner and finally rested on the muslin covering top of cylinder, where it remained three or four days, and afterwards was found on the surface of the earth in a very comatose condition. At this period the larva was a little reduced in length from the time when drawn, namely, September 7th, 1906. The ground-colour was pale creamy-white; medio-dorsal stripe rather pale chestnut-brown, but darker than ground-colour; the subdorsal stripe paler than ground-colour, inclining to a yellowish tinge, and edged on either side with pale chestnut-brown; the spiracular band is of similar colour, but only a very little darker than ground, the spiracles showing dark against it. There is a row of dots above spiracles, in size and colour resembling them, and two similar longitudinal rows on dorsal area. Head dull ochreous-grey, inclining to a greenish tinge as compared with body, with a dark brown line across top; ocelli black; mandibles dark brown. Surface dull throughout, including head, and densely clothed with very short hairs. This larva, after wandering about restlessly for several days, finally fixed itself to muslin covering top of cylinder on March 10th, 1907. It changed to a pupa on March 20th, attached at anal end to a silken pad, and with a silken thread around waist. Two more larvæ emerged from their hybernacula

on March 13th. Their hybernacula were pinned to bits of muslin attached to a stick in the centre of a flower-pot. To these bits of muslin they attached themselves the same day, near by their hybernacula, and both changed to a pupa, head upwards, on March 23rd. Another larva emerged from hybernaculum on March 18th, attached itself the same day in the manner before-mentioned, head upwards, and changed to a pupa on March 24th.

Although these larvæ were in a flower-pot with a growing plant of *Brachypodium sylvaticum*, they never attempted to eat the leaves, neither did they crawl over them, always crawling on the dead leaves which formed their hybernacula, or up the dead stick in the centre of flower-pot, thus proving that they *do not eat* on emergence from their winter sleep, but proceed almost at once to prepare for changing to pupa.

I made three careful drawings of the pupa on March 24th, 1907, together with the following description:—

Pupa. Form cylindrical, slender, both dorsally and ventrally curved, with a little taper to both extremities. Head rather blunt, but with a fairly long spike-like projection directed forward and upward; eyes large and prominent. Pupa widest across base of wing cases, the latter being fairly ample; segmental divisions very clearly defined; spiracles oval; wing cases extend to anterior margin of segment five; maxillæ uncovered and extending rather more than five-sixths length of wing cases; first legs about half-length of maxillæ; second legs about three-quarters length of maxillæ; antennæ scarcely as long as second legs; wing cases rather ridged at sides; labial palpi showing; labrum very prominent; mandibles showing; both dorsal head-piece and prothoracic segment very distinct; abdominal segments have a few slight depressions.

Anal appendages. A flattened projection, dorsally curved, with about a couple of dozen curved spines, hooked at tips, at end, on under side.

Markings. Surface dull, excepting eyes which are a little glazed. Head, wing cases, cases of antennæ, legs, &c., dull yellowish-grey inclining to ochreous-green, with edges of wing cases and antennæ edged with dark brown, whilst the maxillæ are very conspicuous by being dark purplish-grey brown. Abdominal segments and also first, second, and third thoracic segments are of a pale creamy ground-colour. Commencing on dorsal headpiece and terminating on anal appendage is an irregular dark brown band, becoming pinkish towards anal end. On either side of this are two irregular bands, darker than ground-colour and of a pale crimson hue, becoming paler and thinner on second thoracic segment where they commence, as also on ninth segment where they terminate. The area between these two stripes is rather more creamy than general ground-colour. On either side of spiracles is an irregular band of similar hue, but

much paler; ventral area dull greyish-yellow with some pale greyish blotches on segments five to seven; spiracles dullish-yellow; hooks of anal appendage reddish-brown. On two of the four pupæ I had the mandibles were conspicuously black and shining.

On April 16th, 1907, the eyes turned pink and wing cases darkened a little. On April 17th, eyes became dark purplish-grey, and wing cases darker and of a brownish hue. On April 18th, the bodies went dark, and the whole pupa became dusky purplish-grey. On April 21st, three imagines emerged between 12.30 and 1.15 p.m. I first noticed one male fully emerged and drying his wings, which were not quite fully developed. About fifteen minutes later I saw another partly emerged and watched its completion; this proved to be a male also. At 1.15 p.m. my last pupa, which I had been constantly watching with a powerful lens for about half-an-hour, I saw burst first the dorsal line down second thoracic plate; then transversely the division between first and second thoracic plates, and finally the complete emergence. This proved to be a female. One pupa died, the first I had obtained on March 20th. It will therefore be seen that the dates of pupation of the three others were March 23rd (two) and March 24th (one), but they all emerged on the same date, namely, April 21st, 1907, between 12.30 and 1.15 p.m. I therefore have had the gratification of rearing, and recording the complete metamorphosis of, this very local insect.

Lamorna, Truro, Cornwall: March, 1908.

NOTES ON SOME TRANSVAAL MOSQUITOES, INCLUDING TWO NEW SPECIES AND A NEW VARIETY.

BY FRED. V. THEOBALD, M.A.

A LARGE consignment of mosquitoes from the Transvaal, collected by the late Government entomologist, Mr. Simpson, whose untimely death has been so felt and regretted by all in South Africa, has been recently examined, and has proved of considerable interest. Firstly, because two new species were found in it which are described here; secondly, because the rare *Etiorleptomyia mediolineata*, Theob., described from a single specimen from the Sudan, occurs in it; and, thirdly, the enormous variation in size shown in some of the common Vaal species. Three particularly need notice in connection with the latter, namely, *Culex tigripes*, Grandpré, *C. simpsoni*, Theob., and *C. dissimilis*, Theob. The first vary in size from 6·8 to 5 mm., the second from 8 to 4 mm., the latter from 5·5 to 4 mm. The last-named insect is of particular interest, for, as far as I can see

after examining the numerous specimens, the smallest and the narrow pale-banded proboscis forms are my *C. dissimilis*; the large, broad, pale-banded proboscis forms are my *C. hirsutipalpis*. I cannot detect any differences except in size and general appearance, but in the large Transvaal series every gradation from one to the other could be found. I therefore propose to sink *C. hirsutipalpis* as a large variety of *C. dissimilis*. The same is seen in the *Pyretophorus costalis*; some specimens measure 5 mm., one only 3·4 mm., and in the smaller forms the leg markings are less conspicuous.

This collection of some hundreds of specimens is poor in Anophelines, which seem to be only abundant in certain areas of the Transvaal and not uniformly spread over it as in some warm countries.

Besides *P. costalis* the following also occur:—*Cellia squamosa*, Theob., *Pyretophorus cinereus*, Theob., *Myzorhynchus mauritanus*, Grandpré, and *Myzomyia funesta*, Giles.

The large *Theobaldia spathipalpis* of Rondani also occurs in the collection, so we now have it known in Africa at the Cape, Transvaal, Sudan, Egypt, and Algeria, as well as in Southern Europe, the Mediterranean Islands, Canaries, and the Azores.

Banksiella luteolateralis, Theobald, var. *circumluteola*, nov. var.

Head like the type, also proboscis and antennæ; palpi of female all black. Thorax with creamy lateral areas, which unite in front, forming a continuous mass behind the head, the dark median area having only bronzy-brown scales, and being narrowed in front.

The wings have more brown-scaled areas than the type, the only creamy-scaled veins being the basal half of the first long vein and the fifth, except its upper branch; there are also pale lateral scales on the apical half of the subcostal, and a few indistinct ones on the basal part of the second and fourth veins. The stem of the first fork-cell is half the length of the cell, and that of the second about two-thirds the length of the cell. Abdomen as in type, also legs. Length 5 mm.

Habitat. Transvaal (Mr. Simpson).

Observations.—Differs from the type and other varieties in the pale lateral thoracic area extending around the front of the thorax, and by the less pale scaled areas on the wings.

Etiorleptiomyia mediolineata, Theob.

(1st Rept. Wellcome Res. Labs. p. 71) (1904).

The single specimen (a female) in the collection shows some slight variations from the type.

The palpi are white-tipped instead of being all black. The thorax is more ornate, having an area of bronzy scales on each side in front and behind, and a small area on each side between them, these areas separated by the golden scales. The scutellum has some

creamy flat scales with the black ones, which latter only occurred in the type.

The pleuræ have some flat white scales which could not be seen in the type, owing to its being somewhat damaged.

All other characters agree with the specimen from the Pibor.

Ficalbia inornata, nov. sp.

Thorax and abdomen uniform deep brown; proboscis moderately long, deep brown; pleuræ pale brown. Legs uniform brown. The whole insect with bronzy reflections in bright light.

♀. Head brown, with dull flat scales and paler upright forked scales; clypeus pale; proboscis uniform in colour, brown in some lights, violet in others, swollen apically where it is testaceous; antennæ brown; basal segment pale.

Thorax deep brown, with traces of a paler line in the middle and in front at the edges, clothed with scanty narrow-curved bronzy scales and long black backwardly-projecting chaetæ, especially posteriorly and over the roots of the wings; pleuræ pale brown with some grey reflections; scutellum with small flat brown scales showing violet reflections, forming a large mass on the mid lobe, small areas on the lateral lobes, mid lobe with two long median border-bristles, then two shorter ones and a few still smaller; metanotum nude, deep brown. Abdomen brown, unbanded, with metallic violet and traces of green reflections; pale ventrally.

Legs uniform brown, with bronzy and violet metallic reflections, paler basally; ungues small, equal and simple; wings with typical brown Ficalbian scales, a somewhat dense patch of them above the cross-veins; outer costal border spinose and dark; subcostal vein-scales dark, also the single-rowed median vein-scales, lateral ones pale; fork-cells of nearly equal length, the first submarginal slightly the narrower, its base slightly nearer the apex of the wing, its stem not quite twice the length of the cell; stem of the second posterior cell about one and a third the length of the cell; posterior cross-vein wider than the mid, a little more than its own length distant from it; halteres with pale stem and fuscous knob. Length 3 mm.

♂. Head with flat, rather loose violet-brown scales, some showing an ochreous tinge; upright forked-scales dark, showing ochreous reflections in some lights, especially behind; apparently a single large curved median black chaeta projecting forwards between the eyes; antennæ plumose, dark brown, basal segment pale; palpi very short; proboscis dark.

Thorax as in female, but two median bare lines, very distinct. Abdomen as in female, but with traces of indistinct pale basal lateral spots on the three more basal segments. Fore and mid ungues unequal and simple; hind equal and simple.

Wings very similar to the female, but the fork-cells relatively shorter. Length 3 mm.

Habitat. Transvaal (Mr. Simpson).

Observations.—Described from a perfect female and two males.

This is the first female recorded, the three previously known

species all being founded on males. The only other African member of this genus known is *F. nigripes*, Theobald, from Sierra Leone (Mono. Culicid. vol. iv. p. 578, 1906), which differs from the Transvaal species in having a banded abdomen, the basal white bands being very prominent in the Sierra Leone insect. The female wing-scales agree with those of the male in this genus, and the discovery of the female does not necessitate adding anything to the definition of the genus.

Ædes inconspicuus, nov. sp.

Head dull ochreous-brown, paler than the brown thorax; abdomen, legs, and proboscis, all dark brown.

♀. Head deep brown, with small, rather loose, flat scales over most of the area, some dull ochreous, others brown, and others with a dull violet tinge, the ochreous hue prevailing, behind a large patch of narrow-curved ochreous scales, thin ochreous upright forked-scales behind, brown in front; chætæ long, deep brown; palpi rather small, proboscis and clypeus deep brown; antennæ deep brown. Thorax deep brown, with narrow-curved pale brown scales, showing some ochreous reflections; chætæ deep brown; scutellum pale brown, with narrow-curved pale scales and five deep brown border-bristles; metanotum deep shining brown; pleuræ grey.

Abdomen deep brown, with dull violet reflections; on the venter the segments are pale at their bases; border-bristles pale brown.

Legs deep brown, unbanded; the tarsi showing dull ochreous hues; unguis small, equal, much curved and simple.

Wings with long thin brown lateral vein-scales; fork-cells long, the first submarginal cell much longer but only slightly narrower than the second posterior cell, its base considerably nearer the base of the wing than that of the latter, its stem about one-fourth the length of the cell; stem of the second posterior nearly as long as the cell; posterior cross-vein nearly three times its own length distant from the mid. Length 3 mm.

♂. Antennæ plumose, plume-hairs brown, internodes grey; palpi very small, brown. Head, thorax, and abdomen as in the female, but the abdominal segments are deeply constricted at the base and the scales at the apical edges show dull ochreous reflections (not banding). Wings much as in the female, but the stem of the first submarginal cell only one-third the length of the cell, and the posterior cross-vein only about one and a-half times its own length distant from the mid. Unguis of fore and mid legs unequal, unserrate; hind small, equal, and simple. Length 3 mm.

Habitat. Transvaal (Mr. Simpson).

Observations.—Described from a single female and male. A small, brown, inconspicuous mosquito, the only species of this genus as yet recorded from Africa.

ON MOUNTING COLEOPTERA.

BY H. F. FRYER, F.E.S.

(Concluded from p. 88.)

Mountant.—Gum tragacanth dissolved in water to the consistency of a thin jelly, with the addition of a little carbolic acid, is generally recommended, and is perhaps the best mountant for beginners, as it is easy to work with and easily made. For larger species I use a formula containing gum Arabic, sugar water, and alcohol; but with small species, unless very skilfully manipulated, it tends to gum up the antennæ and tarsi, rendering species which depend on these characters very difficult to determine; moreover, the finished effect is "shiny," and not "dead" as with tragacanth.

Instruments.—Two moderately soft hog's-hair brushes, for brushing out the legs of refractory species.

Two camel's-hair, or preferably soft sable, for use with more fragile species.

A very finely-pointed sable for setting.

Two of the finest needles procurable. These should be run into cylindrical corks for holders. I find the core bored from any ordinary cork of good quality with a large-sized cork-borer will do. The needle is run for about one-third of its length, and the cork handle then filed down to a fusiform shape.

A finely-pointed pair of tweezers is almost a necessity for picking up small species and placing them correctly on the card. I am assuming, of course, the possession of the ordinary entomological "nippers," and that nothing—either beetle, card, or pin—is ever touched with the fingers.

A piece of the entomological peat about three inches by eight glued to a piece of soft deal three-fourths of an inch thick for holding the specimens as they are set, and for regulating the height of the card on the point.

A turntable, although not absolutely necessary, is an immense convenience, as a touch of the finger brings the insect to be mounted into any desired position. I use one of those with which microscopists make their cells, and on the brass stage are glued two thicknesses of cabinet cork; at the other end of the wooden support is fixed the handle of a carpenter's gouge, and on this is slipped, at the proper focus, a lens of about two inches diameter and four inches focus. It is a "home-made" arrangement, but with it there is no difficulty in setting up the smallest species.

Method.—I must presume the specimens are in the right state of relaxation; many are perfectly impossible to set unless this is so. Now, taking as an example a very easy species, *Demetrias atricapillus*, the beetle is lifted by a leg with the fine

tweezers, placed on white blotting-paper, and its legs, antennæ, and palpi brushed out with the soft camel's-hair or sable brushes, using one in each hand. I must here insist on the advisability of cultivating the use of both hands in nearly every operation in setting. The proper sized card is then selected, and the locality and date having been written underneath with an etching pen and Indian ink, it is pinned in the centre of the stage of the turntable, and the gum spread evenly over it with a small brush kept solely for this purpose. The beetle is lifted as before, and placed as nearly as possible in its correct position on the card, then with a needle in the left hand to steady it, if need be, its legs, antennæ, and palpi are brushed into position with the finely-pointed sable, which should always be used when possible in preference to a needle. It is well to have a little water at hand in which to dip brushes and needles when they become gummy: the porcelain crucible before mentioned, used for killing, will answer this purpose as well. The legs and antennæ should be symmetrically arranged, the latter pointing towards the corners of the card; after this is done the specimen is placed on the peat-covered board, and the pin pushed down as far as it will go, and when dry the beetle is ready for the cabinet.

The *Rhynchophora* are not quite so easy, and care must be taken to brush out the rostrum and antennæ before placing the beetle on the card. With this section it is generally necessary to work at first with two needles, drawing out a leg on each side at the same time, and avoiding all jerky and ill-regulated movements.

In the more difficult genera still, *Onthophagus*, *Hister*, *Byrrhus*, &c., it is sometimes necessary to hold the insect firmly in position while the legs are drawn out with the fine tweezers. This I do with a bristle similar to that used by lepidopterists. A hole is made with a pin in a small piece of cork the size of a barley corn, a stiff bristle is then inserted, and the pin stuck through at right angles to it. One of these on either side will hold a beetle securely in position while the various manipulations are going on.

I have said nothing as to the advisability of mounting one of a series to show the under side, as it is not every one who recognizes a species at sight, and it is quite possible, where the species are near together, to get the under side of one species mixed up in the series of another. Should, however, it be necessary to mount a specimen in any but the usual way, it should be mounted on its side, as then the characters of both upper and under side can be more or less seen; but I prefer, when one wants to examine the under side, to float off the insect with hot water.

In conclusion, it is as easy, with a little care and patience, to make a perfect specimen as a badly set one, and when a

series is placed in the cabinet, the effect is worth the slight extra trouble.

With regard to recording one's captures I have a Beare & Donisthorpe's 'Catalogue,' interleaved, in which every species taken is set down, with locality and any other note of interest. After a few years a record of this kind becomes very valuable when studying the geographical distribution of species; and though, of course, a collector will conscientiously label each insect he sets, a well written-up catalogue is very convenient for reference.

The Priory, Chatteris: February, 1908.

A NEW VARIETY OF *AMPHIDASYS BETULARIA*.

BY WM. MANSBRIDGE, F.E.S.

At a recent meeting of the Lancashire and Cheshire Entomological Society Mr. T. Baxter, of St. Anne's-on-Sea, sent for exhibition, among other things, a female specimen of a buff form of *A. betularia* captured by himself at St. Anne's in June, 1891. The specimen was kept for five days, but unfortunately no ova were obtained.

A description of Mr. Baxter's insect is as follows:—

Antennæ pale ochreous, banded with black; thorax and abdomen pale ochreous mixed with black; fore wings with costa brownish ochreous, the remainder of the wings ochreous with typical black markings; hind wings with ground-colour somewhat paler ochreous, especially on the costa; black markings typical. The black is somewhat dull, doubtless owing to the presence of a few reddish brown scales, which can be seen in a good light with the help of a strong lens. Expanse 60 mm. (= $2\frac{3}{8}$ in.)

From the above it will be seen that this moth is typical as to the black markings, but that the white ground-colour is replaced by ochreous; and that the normal ochreous suffusion on the costa of the fore wings of the typical female is brownish ochreous.

I have had an opportunity of comparing this specimen with an example of the so-called buff form obtained by the Middleton collectors about 1875 (Entom. xxii. 113, 162; xxxiv. 180, 203, 228, 252, 324), in which the ground-colour is pure white, and the black markings totally pale reddish brown, so that Mr. Baxter's insect is quite distinct from the Middleton varieties.

As this is a natural variation being due to an extension of colour normally present, and likely at any time to recur, I propose the varietal name *ochrearia* to distinguish it.

OBSERVATIONS ON THE LIFE-HISTORIES AND
BIONOMICS OF SOME TACHINIDÆ.

BY H. S. LEIGH.

DIPTERA—although not generally a favourite group with entomologists—forms one of the largest and most important orders of insects. Their economic significance is very great, some of them being capable of conveying the most serious diseases, whilst others act as scavengers by devouring all kinds of waste products.

Many species live parasitically on various lepidopterous larvæ, and thus, together with the ichneumons, help to keep the numbers of certain Lepidoptera within bounds. This is of great importance to man, for some species of caterpillars are very troublesome pests, and at times occur in such countless numbers on cultivated plants as to strip them of all foliage.

In several districts around Manchester the larvæ of *Abraxa grossulariata*, Linn., have been very common during the last few years; I have on one occasion collected 1500 from one garden, and taken about 3000 altogether during 1906 and 1907. This shows how very prevalent the species frequently becomes in some localities, and anything that can help to lessen its numbers will be extremely beneficial.

The Tachinidæ, one of the families comprising the Muscidæ Calyptrata, contains very many species of flies which are parasitic on Lepidoptera and Hymenoptera. These flies look—at first sight—so like the ordinary house fly, *Musca domestica*, Linn., that they are no doubt often mistaken for such.

One species of Tachinid, *Blepharidea vulgaris*, Flin., which attacks the larvæ of *A. grossulariata*, is often very abundant during the latter part of June and beginning of July. I have bred many of these flies from caterpillars collected in May, and Mr. Wainwright says it is “one of our commonest species, with many known hosts.” The proportion of parasites to hosts was about eighty-five of the former to one thousand of the latter, so that rather more than eight per cent. of the caterpillars were parasitised.

Mr. Hewitt* has found that the infected *A. grossulariata* larvæ contain newly-hatched Tachinid larvæ during early May, when the former are about half-grown. About the middle of June both are matured, and the parasite breaks through the body-wall of the host just prior to pupation. The Tachinid larva pupates a few hours after leaving the body of the host, and under natural conditions the pupæ are probably formed on or just below the surface of the soil.

* “Bionomics of certain Calyptrate Muscidæ and their Economic Significance,” Journ. Econ. Biol., vol. 2, No. 3.

It appears that not more than one Tachinid larva is ever present in one caterpillar of *A. grossulariata*, although I have found two or three individuals of another species of Tachinid parasitic on one larva of *Saturnia carpinii*, W. V., *Endromis versicolor*, &c.

The pupal stage lasts approximately a fortnight, the flies beginning to emerge about the end of June, and continuing for a week or more. The flies differ greatly in size, some being half as large again as others; a fact which is no doubt accounted for by the quantity of nourishment acquired during the larval period. The flies live for about a week or ten days in confinement, but seem to take no heed of any lepidopterous larvæ when placed in a cage with them. How these flies exist between this date, June, to the beginning of May in the following year is not definitely known, but Mr. Hewitt suggests that the Tachinid has another brood, and that this brood lives in another species of lepidopterous larva. This view is strengthened by the fact that many records exist of one species of Tachinid infecting different species of lepidopterous larvæ, and it is even suggested that one species of Tachinid might parasitise not only insects belonging to a different species or genus, but of a different order.

A. grossulariata has only one brood* in the year, and if *Blepharidea vulgaris* is confined to it, the flies must survive much longer in the perfect state than they do in confinement.

The young larvæ of *A. grossulariata* do not appear until about the first or second week in August, which would mean the flies living for six weeks at least before being able to deposit any ova. Even then the *A. grossulariata* larvæ are extremely small, and I think it very improbable these Tachinids would infect them. I think that *B. vulgaris* selects a species of lepidopterous larva which is about half grown in early July on which to deposit its eggs. In this case the resulting larvæ would probably be full-grown about the same time as the host, and pupation take place some time in August. These pupæ would then remain unhatched until the following April, when there would be *A. grossulariata* larvæ available for infection.

During September, 1907, I collected about one hundred larvæ of *Spilosoma lubricipeda*, Linn., from which I bred twelve Tachinid larvæ. These appear, from the pupæ, to be a much larger species than *Blepharidea vulgaris*. About the second week in September the Tachinids pupated, and this agreed exactly with the time of pupation of *S. lubricipeda*. I attempted to force these pupæ by placing them on October 18th in a stove, the temperature of which varied from 70° to 85° F. The result was that they absolutely refused to be influenced by the abnormal heat, which was allowed to act for six weeks. Afterwards they

* A partial second generation occasionally arises.

were taken out of the stove and kept under normal conditions, and none have shown any signs of emergence up to the present date (April 6th). This persistence to remain over a lengthened period in the pupal stage—in spite of such great heat—seems rather curious, particularly as the Tachinidæ belong to a group of insects whose development is often completed in a few weeks, and frequently much influenced by temperature.

The Tachinidæ have, I think, a certain number (perhaps two, three, or four) of broods* in the year, and cannot be induced to give rise to an additional one by artificial means. This at any rate appears to be the case in the autumn, but if extra heat be applied throughout the summer months some effect would probably be witnessed. No doubt the Tachinids obtained from the *S. lubricipeda* larvæ had lived during the earlier part of the season in another species of lepidopterous larva, and those individuals bred in September represented the second or third brood.

I have also obtained several species of Tachinidæ from *Endromis versicolor*, Linn., *Saturnia carpini*, W. V., and *S. pyri*, W. V.†; in these instances one caterpillar supported three or four parasites instead of one only, as in *A. grossulariata* and *S. lubricipeda*. The winter was passed in the pupal stage, and my observations contribute to the belief that most, if not all, of the Tachinidæ probably remain in this state throughout the winter.

In most cases the emergence of the Tachinids from winter pupæ takes place about the same time as the emergence of the hosts, *i. e.* those obtained from *E. versicolor* emerged in April; the species parasitic on *S. carpini* in late May and June; those from *S. pyri* in July; and I expect the pupæ bred from *S. lubricipeda* will produce the flies in June. It seems impossible, therefore, that one species of Tachinid can ever be confined to one host or even to hosts belonging to one genus.

About the beginning of June, 1907, I received a few specimens of a Tachinid from Mr. L. W. Newman which had been obtained from the larvæ of *Sesia tipuliformis*, Linn. This species, *Pelatachina tibialis*, Fln., is of economic importance, the “currant clearwing,” which it parasitises, being one of the commonest of the Sesiidæ, and often very destructive to our currant-bushes. How the *S. tipuliformis* larva becomes parasitised I do not know, as it lives in the pith of the stems of currant-bushes, and it is difficult to conceive how the fly is able to deposit its ova in a suitable position for the resulting larvæ to infect their host. Mr. Wainwright informs me that *Pelatachina tibialis*, Fln., has

* This number of broods will vary according to the species, but most probably two or three will be the usual number.

† *Masicera silvatica*, Fln., a species which is parasitic on *S. pyri*, and other hosts; it is a Continental species, and very little known as British.

been bred from other hosts, but that its occurrence as a parasite of one of the Sesiidæ is new. This Tachinid probably attacks another species of lepidopterous larva in June or July, the resulting brood reaching the pupal stage in the autumn, and remaining as pupæ until the following spring. The life-histories of the Tachinidæ are, however, scarcely known; the number of broods in a season, the various hosts infected by a particular species, and the proportion of caterpillars they destroy is still a very uncertain question. The fact of many Tachinidæ being parasitic on certain Lepidoptera, and thus helping to keep some of the ravages of the latter under control, compensates in a great measure for the pernicious habits of other members of the Muscidæ; so that really some of the creatures many persons often condemn as an unmitigated nuisance are, in various ways, of the greatest service to man, and their bionomics of great economic importance.

I wish to express my thanks to Mr. C. J. Wainwright for help received in connection with one or two of the species mentioned.

ODONATA IN GERMANY.—I.

By E. R. SPEYER, F.E.S.

LAST year (1907) I had the opportunity of making some observations on Odonata in Germany. I spent the summer from April till the end of September at Marburg-on-the-Lahn, a University town lying just north of Frankfurt-on-the-Maine. In April I had found two or three stagnant ponds, which seemed suitable for Odonata collecting, and of course there was also the river Lahn.

On the outskirts of the town there is a large pond, lying parallel with the river, and separated from it by a bank only. At one end of it is a reed-bed, and all along it, on the opposite side to the river, runs a high bank covered with grass and small bushes.

At the other end of the town, near the Southern Railway Station, is another large sheet of water some distance from the river. This pond is surrounded by high and steep banks, covered with trees and bushes on one side of the water, and with high grass on the other. The water is ornamented with yellow water-lilies and high reeds, the whole forming an ideal spot for insect life.

In the immediate neighbourhood there is no other stagnant water, with the exception of two small ponds in a brickyard on the road to Giessen.

About five miles from Marburg itself towards Giessen is a marsh, which proved very productive for certain species of dragonflies not found elsewhere in the district.

Almost all the species mentioned below were identified by the help of Mr. Lucas's excellent book on 'British Dragonflies,' and Dr. Selys's 'Monographie des Libellulidées d'Europe.'

My thanks are especially due to Mr. K. J. Morton, of Edinburgh, who so kindly identified and distinguished the species of the genus *Sympetrum* for me. For the identification of *Erythromma viridulum* I am indebted to the editor of the Ent. Mo. Mag., and Mr. H. Champion supplied me with information about the Acari on the body of *Erythromma naias*.

In this part of my paper the Anisopterid Odonata only are dealt with. The second part will treat of the Zygopterides.

The following Anisopterides were observed during the summer of 1907 at Marburg-on-the-Lahn :—

Sympetrum striolatum, Charp.—Owing to my having mistaken this species for *S. vulgatum*, I am not quite clear as to how common the former really is. At any rate, I took very few specimens, and never saw the female. Its distribution seemed also limited, for I have no specimens from the brickyard, the river, or the marsh.

The first specimen was taken on August 27th, and I have no record of it after September 9th.

S. vulgatum, Linn.—This interesting dragonfly was well distributed, but not very plentiful; in the brickyard and along the river, however, I did not observe it.

A male and female made their appearance on August 25th, and on September 23rd the species was still obtainable.

A female taken in the marsh on September 8th had the lines on the sides of the abdominal segments broadly and distinctly marked, and males observed after this date had very brown wings.

S. sanguineum, Müll.—The insect occurred in plenty from July to September in all the localities except in the brickyard. There was little variety in the size and colour of the specimens, but they were smaller than most British examples. On July 8th I took the first specimen, an immature female, and the species must last well into October.

S. flaveolum, Linn.—The marsh was the only place where I found this species. There it was very plentiful in September, and exhibited great variety in size and in the amount of saffron suffusion on the wings. The smallest specimens measured 28.5 mm. only. At first I took the latter to be hybrids of this species with either *S. scoticum* or *S. sanguineum*, especially as I had found the different species united *per. coll.* on several occasions; but Mr. Morton, to whom I sent specimens, concludes that they are varieties only.

S. scoticum, Don.—Like the last species, this one was also obtained in the marsh in September, but it was less plentiful, and the female was scarce.

It was the habit of the male to hover just over the tops of the reeds, and to settle very seldom, making its capture a very difficult matter, as it was always remarkably shy.

As alluded to above, I took a male of this species united *per. coll.* with a female *S. flaveolum*, and on another occasion I captured a male *S. sanguineum* united *per. coll.* with a female *S. scoticum*.

Libellula depressa, Linn.—This insect appeared in the brick-yard only, and in June it was sometimes plentiful there. On May 23rd I took an immature female, and on July 21st a very much worn female fell to my net.

One hot day in June I saw a male and female flying on intimate terms, and in trying to catch them I knocked the female into the water. Several males immediately came and hovered over her, and I could have taken quite a number if I had wished. This would perhaps be a good method of catching males of *Anax imperator* or of any other species difficult to net.

L. quadrimaculata, Linn.—A single male of this dragonfly turned up at the pond adjoining the Lahn on July 8th. I did not observe the species again.

The specimen in question has very little saffron suffusion on the wings, and there is no brown suffusion at their extremities at all. At the nodal points the black cloud is but slightly marked. This is curious, considering that South of England specimens as a rule have more suffusion on the wings than those from the north.

Orthetrum cancellatum, Linn.—This was certainly an abundant dragonfly.

On June 10th, as I was walking along the bank of the pond adjoining the Lahn, scores of immature females flew out of the long grass when they were disturbed. But their chance of escaping with their lives was small, for they were slow of flight, and many of those which did not enter the collector's net made dainty morsels for the flocks of sparrows which apparently awaited them at the top of the bank.

When mature the habits of this dragonfly are very different. To see a mature male, fully invested with his blue colour, and flying at full speed over the surface of the water, is indeed a wonderful sight; suddenly the insect sweeps round, and the next moment is quietly resting on a piece of bare ground on the bank; here he remains with wings bent over. Now is the collector's only chance; he must approach carefully from behind, but not too slowly, or the dragonfly darts off, only to settle some distance further on, or once more to embark on its reckless flight over the water.

The habits of the female when ovipositing are also interesting. At about a yard from the bank she may be seen dipping the tip of her abdomen quickly and at random into the water, flying onwards all the while. After a time she will fly out over the water, probably followed by several males, one of which will copulate with her, and both will fly back to settle on the bank; having rested there awhile, both fly over the water, and the female breaking loose again begins ovipositing. I watched the same female do this repeatedly, and the process of oviposition seems to point to the fact that, in this dragonfly, different batches of eggs are fertilized separately. The female emerges about a week before the male. The females which I took in August perhaps had a trace of blue powder on the abdomen.

I observed the insect for the last time on August 27th. In July there were a few specimens in the brickyard, but the species was most plentiful at the pond adjoining the Lahn.

Cordulia aenea, Linn.—The first dragonfly I came across in Marburg was an immature female of this species; it was picked up in the town on May 12th and brought to me. On May 23rd it was out in some numbers along the banks of the Lahn towards Giessen, but on May 25th there were none to be seen in this locality. I next observed the species on June 9th at the pond adjoining the Lahn, and after this it was plentiful until August 3rd, after which date I did not observe it. From the brickyard and the marsh I did not record it. It was also plentiful along the banks of the Lahn in June, and at a small pond in the Marburg botanical gardens, which, by the way, are situated in the heart of the town. The habit of this species is to fly backwards and forwards along the edges of ponds, seldom settling under the banks. It is very wary and difficult to net. Once or twice I saw specimens settle in the grass; and on one occasion I found a male resting on a dead twig.

The female oviposits in the shallow water among reeds by dropping the eggs quite at random. When thus engaged the insect is by no means shy.

Somatochlora metallica, Van der L.—On August 3rd I noticed a dragonfly ovipositing in the thick reeds by the side of the pond near the Southern Railway Station. At first I thought it was *Cordulia aenea*, but when I tried to net it, it at once flew up and settled among the branches of a plum-tree close by. Thinking this very peculiar for a female *C. aenea* to do, I followed and drove the insect back to the water, where I captured it, and found it to be a fine female of *S. metallica*.

Ovipositing is much the same as that of the last species.

I did not come across the dragonfly again.

Gomphus vulgatissimus, Linn.—While boating on the river Lahn on May 15th, I found an empty nymph-case clinging to a leaf on the bank.

On May 23rd the insect was out in large numbers along the river towards Giessen; it was then immature. On May 25th I expected to find it plentiful again, but the result of a morning's search revealed a single female only, and I never saw the dragonfly again.

Evidently most of the life of this species is spent far from water, but when and where ovipositing takes place remains a mystery to me.

Lindenia forcipata, Linn.—I took two males of this remarkable species; one rather immature one on June 27th on the banks of the Lahn, and another mature one on September 19th near the Southern Railway Station. In addition to these, I believe I saw another male at the pond by the Lahn on July 8th.

The habit of the male is to settle repeatedly on the bare ground. Its flight is rapid, but it is not shy, and can easily be taken in the net. The species is quite unique with regard to its anal appendages, which are turned in at right angles to each other.

Æschna cyanea, Müll.—To my surprise this species was most uncommon, but in hotter summers it is no doubt very plentiful. I took the first male on August 26th; on September 9th the males were plentiful at the pond near the Southern Railway Station. In the marsh I took two males. On September 19th the species was by no means over, and it probably lasts till the beginning of November in favourable weather.

Æ. grandis, Linn.—Undoubtedly common and well distributed in Europe, *Æ. grandis* was also extremely plentiful at Marburg. On August 3rd the first specimen (a female) turned up, and on the same date I found an empty nymph-case.

When ovipositing, it was no difficult matter to catch the female, but the male would always fly rapidly backwards and forwards in the centre of the pond, very seldom settling on the banks; and here it was impossible to net, for if the least attempt was made to approach it, it would fly off at once. While on the wing it would occasionally give a large swoop over *terra firma*, and then it was the collector's only chance.

Æ. isosceles, Müll.—I hardly expected to find this magnificent dragonfly; but one hot afternoon in June (the exact date was June 28th) I saw a fine male hovering and circling over the pond near the Southern Railway Station. With the small net I had with me, it was no easy matter to catch it, although I repeatedly got nearly within striking distance. After flying lazily over the water, the insect would settle on a reed and remain there some time. When approached from in front it was very shy, but from behind I once got within easy striking distance—but my stroke was a bungling one, and off soared the beautiful creature over the trees, leaving me with the impression that I was not going to see it again. But within five minutes it was again hovering

over exactly the same spot, and in another thirty seconds was in my possession, for this time my net struck true.

On July 21st I found a nymph-case clinging to the reeds in the same locality; and on July 16th I saw a dragonfly which appeared to be another male of this species, but I was unable to capture it.

(To be continued.)

NEW AFRICAN BEES.

By T. D. A. COCKERELL.

Anthophora domicola, sp. nov.

♀. Length about 13 mm.; anterior wing about 10; black, with hair of head and thorax above, apical margin of second abdominal segment, and the segments following entirely (except a few black hairs at base of second and third) rufo-fulvous; hairs of scutellum (except at extreme sides anteriorly), of metathorax, of first abdominal segment and of second except apical margin, black or brown-black; hair of cheeks and pleura and anterior legs white; of middle and hind legs black. Closely allied in all respects to *A. atrocincta*, Lep., but considerably smaller, with the wings pallid, suffused with brown along the veins, the reddish hair not so bright; and the lateral black areas of the clypeus indented below, the whole shaped like a boot with a sharp toe and a large heavy heel. The black areas of the clypeus are dull and granular, with rather sparse shallow punctures. The pygidial plate has dark hairs at its sides, but there is no black patch on the fifth segment, such as there is in *A. atrocincta*.

Hab. Benguella hinterland, West Africa, January, 1908; "from hole in side of mud house" (F. C. Wellman); Ekuiva Valley, West Africa, 1907 (F. C. Wellman). The latter specimen was at flowers of mint, together with *A. quadrifasciata*, Vill.

Anthophora ekuivensis, sp. nov.

♀. Length about 12 mm.; superficially just like *A. quadrifasciata*, but evidently distinct, by the following characters: mandibles stouter, only the basal third or less yellow; labrum with a central yellow lobiform area surrounded by black, and here rather elevated; median stripe of clypeus thorn-like, not reaching upper border; no light supraclypeal mark; tegulæ more shining; hind basitarsus entirely covered with white hair on outer side; ventral abdominal segments with long hair-fringes, which are fuscous in the middle and white laterally. The wings are dusky and subviolaceous.

Hab. Ekuiva Valley, West Africa, 1907 (F. C. Wellman).

Halictus jucundus benguellensis, subsp. nov.

♀. Agreeing with *H. jucundus*, Smith, from Willowmore, Cape Colony (Brauns), except that the wings are strongly dusky, and the

nervures and stigma are darker. The insect is larger than *H. vire-scens*, Lep., from Bozen, Tirol (Friese), and differs, as Vachal has indicated, in the teeth of the hind spur. The metathoracic character mentioned by Vachal is scarcely distinctive for the *Benguella* form. Smith described *H. jucundus* from the Cape and Sierra Leone, but the former must be taken as the type locality, as it is given first, and the wings are described as hyaline, with the nervures and tegulæ pale testaceous. The measurement given by Smith for the female is at least 2 mm. too small for the *Benguella* insect.

Hab. *Benguella* hinterland, at flowers of an orchid, January, 1908 (Wellman); Ekuiva Valley, at flowers of *Geigeria*, 1907 (Wellman).

Halictus creightoni, sp. nov.

♀. Length about 8 mm.; anterior wing about $6\frac{1}{2}$; black, with dull white hair; abdomen black, with the hind margins of the segments concolorous; bases of segments 2 to 4 with bands of dense pure white tomentum, these all broad laterally, but narrowing medially, and failing dorsally on 2 and 3; tegulæ shining black; wings strongly dusky, nervures and stigma black; legs black, except claw-joints, which are reddish; hair of legs white, faintly yellowish on inner side of tarsi, brush at end of hind basitarsus dark fusco-ferruginous; spurs ferruginous; hind spur long, its apical half simple, the basal half with a row of minute nodules; apical region of abdomen with scattered coarse black bristles, the rima not distinguished by any colour. Hair at sides of face silvery; antennæ entirely black; face rather narrow; clypeus produced, with an irregular sculpture; front dull and granular; mesothorax with very little hair, dull, with scattered punctures; scutellum more shining, and quite closely punctured, the punctures of various sizes; area of metathorax with strong longitudinal wavy plications, its margin well-defined and sharp; abdomen moderately shining. Post-scutellum with greyish-white tomentum.

Hab. *Benguella* hinterland, West Africa, January 3rd, 1908 (F. Creighton Wellman). Taken, with numerous other bees (*Anthophora cærulea*, Friese, *A. convolvuli*, Ckll., &c.), from a small patch of flowering Compositæ, species of *Othonna* and *Geigeria*. This has a general resemblance to several European species; they are separable by the following table:—

Area of metathorax with a fine grooving or lineolation; face very broad . . .		<i>maculatus</i> , Smith.
Area of metathorax plicate or ridged . . .		1.
1. Mesothorax very shiny, smooth, with sparse punctures		<i>morbillosus</i> , Kriechb.
Mesothorax not thus shiny and smooth . . .		2.
2. Hair on post-scutellum long and fuscous; wings clear		<i>leucozonius</i> (Schrank).
Hair on post-scutellum short and greyish white; wings darkened		<i>creightoni</i> , Ckll.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES
ON THE HEMIPTERA.—No. 8.

BY G. W. KIRKALDY.

A.

I do not propose to reply in detail to Mr. Distant's recent criticisms (Entom. 1907, pp. 15 and 36), as the matter is not of interest to entomologists in general, and the facts and opinions are cited on both sides for hemipterists to choose from. Mr. Distant, however, implies that I employ a nomenclature of my own, and that my style of citation is incorrect.

In using "*Leptocoris*" I have simply selected the name which is proper under the rules followed by every living hemipterist but Mr. Distant, *viz.* priority. This name was proposed in 1833* by Hahn for a single species *rufus* (= *abdominalis*). Spinola in 1837 erected *Serinetha*, with type *abdominalis*, alleging at the time that *Leptocoris* was preoccupied by *Leptocoryza* (sic!). As a matter of fact *Leptocorixa* was founded by Berthold in 1827 (from the French form *Leptocorise* of 1825), altered by Latreille in 1829 to *Leptocorisa*. According to recognized rules, *Leptocoris* is not preoccupied by *Leptocorixa* or *Leptocorisa*. With regard to Mr. Distant's appeal to "authority," Dallas's work is nearly sixty years old, while Stål and Lethierry and Severin are notoriously indifferent to the principle of priority. It is because Bergroth is so "strict an observer of the law" that I feel sure he would now use *Leptocoris*.

Mr. Distant further says, "but it is inexact to write '*Serinetha*, Dist.'; he gives me too much credit." On looking at the context (Ent. xl. pp. 282-3), it will be seen that my note referred to omissions from the 'Fauna of India,' and the generic name in square brackets obviously was that under which the species would be found in Mr. Distant's index.

Another small point I may now refer to is that on p. 87 of vol. xl. (1907). Colonel Bingham states that the date 1830 for the text of the 'Coquille' was not corrected in print to 1838 till 1906, after the third volume of Mr. Distant's 'Fauna of India—Hemiptera' was in print. This is inaccurate, for the correction was published *four years* previously, *viz.* in the 'Entomologist' for 1902 (pp. 316-7), under a special heading.

II.

Family CIMICIDÆ.

Phlæophana, gen. nov.

Allied to *Phlæa*, Lep. & Serv., but differing by the juga being non-contiguous apically; the much longer labium; the much

* Not 1831, as Mr. Distant persists in citing.

longer scutellum, differently formed corium and membrane. Type, *Phlæa longirostris*, Spin.

In the 'Fauna of India—Hem. I.' Mr. Distant cites *lineolatus* as the type of *Podisus*, and in this he has unfortunately been followed by Schouteden (Gen. Ins.).

Podisus was founded by Herrich-Schäffer in the 'Wanzen-artigen Insecten,' ix. 296, without mention of species. On p. 338 he describes five species, viz. *punctipennis*, *strigipes*, *vittipennis*, *pallipes*, and *albiseptus*. The first general treatment was apparently that of Stål in 1870. In that *punctipennis* is placed under *Apateticus*; *vittipennis* under *Podisus*; *pallipes* as uncertain; *albiseptus* under *Tynacantha*; *strigipes* under *Mineus*. I think, therefore, that the type of *Podisus* is *vittipennis* (= *bifidus*).

Montrouzierellus, n. n. = *Platynopus*, subgen. † *Acanthomera*, Montr. (type, *melacanthus*).

Austromalaya, n. n. = † *spudæus*, Stål.

Glaucias, n. n. = † *Zangis*, Stål.

Bœria, n. n. = † *Panda*, Distant.

Family CICALIDÆ.

Psalmocharias, n. n. = † *Sena*, Distant.

There are several points of nomenclature on which I have not answered criticisms as yet. These will be dealt with in detail in the Introduction to the first volume of the 'Catalogue of the Hemiptera' now in the press.

DESCRIPTION OF A NEW SPECIES OF SAWFLY (*SELANDRIA*) FROM BORNEO.

By P. CAMERON.

Selandria kuchingensis, sp. nov.

Black, shining; the apex of the femora narrowly, the basal three-fourths of the tibiæ, and the tarsi white; wings iridescent, hyaline, distinctly suffused with fuscous: the costa, stigma, and nervures black, the costa thicker than usual; the first transverse cubital nervure very faint, almost obliterated; the transverse radial nervure has the lower half bullated; the second recurrent nervure is received at the apex of the basal fourth of the cellule. Head and thorax bearing a short white pile. ♂. Length, 4 mm.

Kuching, Borneo; May (John Hewitt).

Basal joints of antennæ fuscous, the third as long as the fourth and half of the fifth, the fifth, sixth, and seventh dilated, thicker than the apical pair. Frontal area large, raised, widened towards the apex, the top enclosing the lower ocellus. A stout keel between the antennæ. Clypeus opaque, shagreened, its apex broadly transverse.

Palpi clear white. Mesonotum distinctly trilobate, the middle lobe with a deep furrow down the centre. Cenchri large, clear white. The dorsal middle segments of the abdomen are fuscous. Calcaria short, testaceous. The first joint of the hind tarsi is blackish-fuscous, narrowly white at the base and apex, the second is testaceous, blackish above, the third and fourth black, the fifth black, white at the base.

NOTES ON BRITISH BRACONIDÆ.—VI.

By CLAUDE MORLEY, F.E.S., &c.

(Continued from vol. xl. p. 254.)

METEORIDÆ.

THIS small subfamily consists of some thirty species, which so closely resemble the ichneumonidous *Hemiteles* in the structure of their petiolated abdomen, &c., that I found an individual of the latter genus among them, while working on this paper, in my collection; it also is related to the Euphoridæ, among Braconids, though its possession of three cubital cells will at once distinguish it therefrom. Its species are mainly parasitic on Lepidoptera, sometimes socially but usually solitarily: one, I shall show, has been bred from a sawfly, and several are reputed to prey upon beetles; while *M. obfuscator* is constantly being bred by coleopterists from the heteromerous *Orchesia micans* in Boleti on elm trees. The following table will sufficiently distinguish our species, many of which appear at first sight very obscure, but become easily recognized with a little practice; and the last four or five are, perhaps, but varieties of the same. There is but one genus:—

METEORUS, Hal.

- | | | |
|------|--|-----------------------------------|
| (44) | 1. Post-petiole discally bisulcate at the base. | |
| (5) | 2. Radial cell of lower wing divided by a transverse nervure | (ZEMIOTES, Först.). |
| (4) | 3. Costal and median cells of upper wing of subequal length | 1. <i>albiditarsis</i> , Curt. |
| (3) | 4. Costal cell distinctly shorter than the median | 2. <i>caligatus</i> , Hal. |
| (2) | 5. Radial cell of lower wing not divided. | |
| (7) | 6. Costal cell as long or longer than median (PROTELUS, Först.). | 3. <i>chrysophthalmus</i> , Nees. |
| (6) | 7. Costal cell shorter than the median. | |
| (33) | 8. Recurrent nervure emitted before apex of first cubital cell. | |
| (12) | 9. Antennæ with at least thirty-five joints. | |
| (11) | 10. Post-petiole twice longer than apically broad: abdomen longer. | 4. <i>deceptor</i> , Wesm. |

- (10) 11. Post-petiole decidedly shorter ; abdomen also shorter 5. *pallidus*, Nees.
- (9) 12. Antennæ with at most thirty joints.
- (20) 13. Stigma unicolorous, flavidous or testaceous.
- (15) 14. Face piceous or black ; legs often infusate 6. *tabidus*, Wesm.
- (14) 15. Face testaceous or rufescent.
- (19) 16. Sternauli deep ; antennæ of female thirty-two jointed.
- (18) 17. Antennæ infusate or piceous 7. *pallidipes*, Wesm.
- (17) 18. Antennæ flavidous or testaceous 8. *ictericus*, Nees.
- (16) 19. Sternauli shallow ; antennæ of female twenty-seven jointed 9. *confinis*, Ruthe.
- (13) 20. Stigma piceous or infusate, usually paler basally.
- (22) 21. Legs broadly infusate 6. *tabidus*, supra.
- (21) 22. Legs testaceous.
- (30) 23. Wings not clouded ; second cubital cell not contracted towards radial nervure.
- (29) 24. Wings not lacteous ; abdomen usually pale-marked.
- (26) 25. Metathorax smooth 10. *vexator*, Hal.
- (25) 26. Metathorax rugulose (not punctate).
- (28) 27. Head broader than thorax ; stigma larger and darker 11. *obfuscatus*, Nees.
- (27) 28. Head not broader than thorax ; stigma smaller and paler 12. *punctiventris*, Ruthe.
- (24) 29. Wings lacteous ; abdomen nearly totally black 13. *atrator*, Curt.
- (23) 30. Wings clouded ; second cubital cell distinctly contracted above.
- (32) 31. Second cubital cell strongly contracted, subtriangular 14. *albicornis*, Ruthe.
- (31) 32. Second cubital cell less contracted, trapeziform 15. *abdominator*, Nees.
- (8) 33. Recurrent nervure emitted at or beyond apex of first cubital cell.
- (35) 34. Length, $2\frac{2}{3}$ mm. ; terebra longer than abdomen 16. *jaculator*, Hal.
- (34) 35. Larger ; terebra not longer than abdomen.
- (39) 36. Stigma piceous, sometimes externally pale.
- (38) 37. Stigma unicolorous piceous 17. *melanostictus*, Cap.
- (37) 38. Stigma paler, with the outer border stramineous 18. *pulchricornis*, Wesm.
- (36) 39. Stigma pale, with the border sometimes darker.
- (41) 40. Terebra as long as the abdomen ; male unknown 19. *consors*, Ruthe.

- (40) 41. Terebra shorter than the abdomen.
 (43) 42. Body broadly marked with black, especially the metathorax . . . 20. *scutellator*, Nees.
 (42) 43. Body entirely testaceous, basal segment at most infusate . . . 21. *unicolor*, Wesm.
 (1) 44. Post-petiole not discally bisulcate, though often aciculate.
 (46) 45. Wings short, narrow and clouded, white below stigma . . . 22. *micropterus*, Hal.
 (45) 46. Wings normally developed and hyaline.
 (48) 47. Petiole white or paler than post-petiole . . . 23. *versicolor*, Wesm.
 (47) 48. Petiole not pale, usually black.
 (56) 49. Stigma piceous and internally pale.
 (53) 50. Head broader than thorax; terebra as long as abdomen.
 (52) 51. First abscissa of radial nervure much shorter than the second . . . 24. *profligator*, Hal.
 (51) 52. First abscissa of radial nervure as long as second . . . 25. *filator*, Hal.
 (50) 53. Head narrower than thorax; terebra shorter than abdomen.
 (55) 54. Petiole shorter than post-petiole . . . 26. *cinctellus*, Nees.
 (54) 55. Petiole as long as the post-petiole . . . 27. *tenellus*, Marsh.
 (49) 56. Stigma entirely pale.
 (60) 57. Antennæ at most twenty-eight jointed, of female filiform.
 (59) 58. Body testaceous, with only the abdomen basally infusate . . . 28. *rubens*, Nees.
 (58) 59. Body mainly black, centre of abdomen pale . . . 29. *læviventris*, Wesm.
 (57) 60. Antennæ at least thirty-jointed, of male and female setaceous.
 (62) 61. Abdomen black, with at most second segment pale-marked . . . 30. *fragilis*, Wesm.
 (61) 62. Abdomen mainly, or body entirely, testaceous . . . 31. *luridus*, Ruthe.

1. *albiditarsis*.—An abundant species. I have it from Inveruglas, Scotland (Dalglish); New Forest (Miss Chawner); Bentley Woods, near Ipswich (Elliott); Guestling, near Hastings, in 1876 and 1889—the females misnamed *Zele testaceator* by Bridgman—(Bloomfield). I have several times taken the females flying round young trees about Ipswich, and beaten the males both there and at Wilverley, in the New Forest. It is on the wing from May 16th till July 1st. Marshall gives no authority for his statement that the cocoon—which he correctly describes as woolly, spindle-shaped, dirty yellow, with a very tough leathery lining—is attached to leaves. On the contrary, Wigin sent me, on November 18th, 1899, thirteen which he had dug up from beneath the surface of his garden at Methley,

Leeds, with those of *Exetastes cinctipes* and *E. illusor*; he said that in all probability they had emanated from *Mamestra brassicæ* or *Hadena oleracea*. Of the thirteen I can only find that six (all males) emerged between May 28th, 1900, when one was out at 10 a.m. since midnight, and June 18th, 1900, when three had emerged since 6th. The last emerged between 2 p.m. on June 3rd and 11 p.m. the preceding night. On October 31st, 1900, he sent me twenty more cocoons similarly obtained, and from these but five imagines emerged; both sexes on May 26th, 1901, between midnight and 11 a.m., a male on 29th, and both sexes on June 2nd between midnight and 10 a.m. Clutten has bred it at Burnley; Blair as early as May 10th; and Bignell in Devon from *Hadena suasa*. On May 13th, 1904, Blair bred a single female from a "whole batch" of New Forest *Tæniocampa miniosa*, among a number of *Meniscus murinus* (cf. my 'Ichneumons of Britain,' vol. iii.). He particularly informs me that the cocoon is spun underground. Marshall could cite no specified hosts.

2. *caligatus*.—This appears to me to differ from *M. deceptor* only in the faintly defined dividing nervure. It is restricted to Britain. I have only three males, taken by Miss Chawner in the New Forest; Dr. Capron about Shere, in Surrey; and myself by beating *Prunus spinosa* at Barham Green (William Kirby's parish) on May 27th, 1899.

3. *chrysophthalmus*.—Both sexes bred on May 20th, 1903, from *Nephoteryx hostilis*, taken in South Essex during the preceding autumn (Thurnall); one female bred from *Phlyetenodes turbidalis* at La Granja, in Spain (Chapman). In the latter case the parasite had emerged from the larva after the latter had constructed its cocoon and spun its own within that of the host; the former is pure white, dull, subcylindrical, and not very rough; from it the imago emerged at the smaller apex, which was entirely cut round, but held *in situ* by the wool. Unlike the foregoing species, this is abroad in the autumn as well as the spring, since I swept a female at Freston, in Suffolk, on September 7th, 1896. It has also occurred to me at Bentley and Brandon in the same county in late May and early June, to Miss Chawner in the New Forest, and to Charbonnier at Bristol in July.

4. *deceptor*.—A common species, whose larva spins its cocoon within that of its host; the former is pure white and similar in consistency to that of the last species, but a great deal more attenuate at one end. Tonge, however, tells me that he found a cocoon free on Scotch fir in a Reigate garden in October, from which this species emerged on 5th of the following July. It has also been bred by Porritt in Yorkshire, and Clutten at Burnley; Felden, in Herts (Piffard); Tuddenham Fen, in Suffolk (E. G. J. Sparke); New Forest, at the end of May (Adams); and Guestling

(Bloomfield). I took a female at Ringstead, in Norfolk, as late as August 23rd, 1906.

6. *tabidus*.—I have five specimens appearing to belong to nothing but this species, which is said to prey upon Longicorn beetles. Three were bred by Mrs. Holmes at Sevenoaks in 1906 from *Eupithecia minutata*, and had spun white or pale ochreous cottony, cylindrical cocoons of 5 mm. in length, from which one failed to emerge, and had, as the Parasitica often do in such cases, died with its head inwards; one female was captured by Wilson Saunders at Reigate in July, 1872; and I took the last on bracken at the Wilverley Enclosure, near Brockenhurst, June 14th, 1907.

(To be continued.)

NOTES AND OBSERVATIONS.

THE ENTOMOLOGICAL SOCIETY OF AMERICA.—The third meeting of the Entomological Society of America was held at the University of Chicago, December 30th and 31st, 1907, in affiliation with the American Association for the Advancement of Science, and other societies. About one hundred were in attendance, coming from as widely remote localities as Maine and California, Ottawa and Louisiana. On Monday sessions were held for the reading of papers, among which were the following:—

“Notes on the Geographical Affinities of the Isle Royale, Lake Superior” (an outline of the relations of the Isle Royale fauna (beetle fauna) to that of Northern North America. General remarks on the major faunal centres based on beetles), by Charles C. Adams. “Some Problems in Nomenclature” (a brief discussion of the validity of names, particularly those bestowed on insect galls and larvæ), by Dr. E. P. Felt. “Stereoscopic Photography Applied to Entomological Subjects” (exhibition of excellent stereoscopic effects brought about by an ingenious but simple apparatus), by Professor F. L. Washburn. “Is Mutation a Factor in the Production of Vestigial Wings among Insects?” (a summary of some observations among insects belonging to various groups, where the evolution of wingless or subapterous species can be traced within a genus or small group), by Charles T. Brues. “The Mouth-parts and Phylogeny of Siricidæ,” by J. Chester Bradley. “On Certain Structural Characters of the Genus *Catocala*,” by W. Beutenmuller. “Is *Vespa borealis* an Inquiline?” (an account of finding males and females of *Vespa borealis* living in the nest of *V. diabolica* on several occasions, apparently on perfectly friendly terms), by Dr. James Fletcher. “The Entomological Society of America and its Work,” by Henry H. Lyman. “The Habits of the Crane-Fly, *Dicranomyia defuncta*, O. S.,” by James G. Needham. “The Life-History of a Bee-Fly (*Spogostylum anale*, Say), the Larvæ Parasitic on the Larvæ of a Tiger Beetle (*Cicindela soutellaris*, Say)” (the eggs are laid in July and August; larvæ on the last larval stage of the

host in the spring; when the host makes its pupal cell and the internal parts become semi-fluid, the parasite moults and grows very rapidly, completely destroying the host (July). The pupa digs toward the surface by wriggling movements of the body, and the adult emerges when the surface is reached. Title only), by Victor E. Shelford. "Ancestral Ephemeridæ from the American Permian Formation" (a group of true Ephemeridæ obtained from the Permian of Kansas. The earliest known true Ephemerids, and, with the exception of a few Russian specimens, all that are known from the Permian. They present a distinct early stage in the evolution of the Ephemerid line), by Dr. E. H. Sellards. "Observations on the Life-History and Adaptation of a New Semi-aquatic Aphid" (habits, life-history, and specialization of *Aphis aquaticus*, novus, found on the water-thyme; many remarkable adaptations to its semi-aquatic life), by C. F. Jackson. "Habits of the Larvæ of *Lycæna*," by J. H. Cook.

On Monday evening the Annual Address was given before the Society by Professor Herbert Osborn, of the Ohio State University, his subject being "The Habits of Insects as a Factor in Classification." The address was followed by a most enjoyable smoker, at which the members of the Society and their friends were the guests of the Entomological Section of the Chicago Academy of Sciences.

MELITÆA PARTHENIE VAR. VARIA: A CORRECTION.—The statement on p. 57 of the current volume by me that *M. parthenie* var. *varia* was met with is a mistake, the specimen referred to being only a slightly under-sized dusky form of *M. parthenie*. Mr. Wheeler tells me that the true "*varia*" does not occur in the immediate vicinity of Bérissal. R. M. PRIDEAUX; "Woodlands," Brasted Chart, near Sevenoaks.

A FEW NOTES ON BREEDING EXPERIENCES IN 1907. — Before writing my notes a short description of my breeding apparatus will make them more readily understood. I have for ova and newly-hatched larvæ three-inch glass-lidded metal boxes; for small broods and intermediate stages glass candle-chimneys (such as are used to protect candles from the wind) stuck into a perforated zinc rim, which in turn is embedded in a four-inch flower-pot filled with a mixture of peat and sand, and in the centre a small phial for food-plant. For larger broods and larger larvæ, two horticultural bell-glasses inserted in their stands, three or four small bread-pans or pork-crocks filled with peat and sand to the depth of the glass phials, and three or four large-sized deep flower-pots; besides sleeves innumerable. All above except metal boxes are covered with tiffany.

Anticlea rubidata.—Female, captured July, 1906; ova laid freely, and hatching produced healthy larvæ, which fed on bedstraw; were only moved once, from box to bell-glass, and were no trouble at all. Bedstraw being difficult to put in water and also to remove, I contented myself with just putting fresh food on the top of the old every other day. Very successful, and a fine emergence in July, 1907. This insect must be bred to get it at its best.

Lophopteryx camelina.—A very early female, taken at rest April, 1907, deposited about thirty ova; the larvæ were sleeved when about

a fortnight old on birch, and fed up fairly well. Several died, but twelve to eighteen pupated in cocoa-nut fibre placed in box in sleeve, and the moths successfully emerged in August.

Odontosia carmelita.—Having obtained three pupæ from Mr. Newman, of Bexley, I was agreeably surprised to find both a male and female emerge together one fine morning in April. When placed in a candle-chimney cage covered with tiffany they paired at about sunset, and some fifty ova were subsequently obtained. Having been advised to sleeve the larvæ, I did so about ten days after hatching, but all gradually sickened and died, the last succumbing when about half-grown in late July. Three friends had some of these larvæ, and all were equally unsuccessful. It has been suggested to me that the reason for failure was the honeydew on the leaves caused by aphides, which were very numerous. This seems feasible, as other species fed and sleeved on same birch likewise sickened, though some did fairly well, as *falcula* and *camelina*. Can any reader throw out a suggestion?—HAROLD E. WINSER; Kent House, Cranleigh, Surrey.

CAPTURES AND FIELD REPORTS.

NOLA ALBULALIS IN SUSSEX.—About the end of July, 1906, a specimen of *Nola albulalis* was taken by my brother Geoffrey at the foot of the Downs near Lewes. Owing to his having done very little entomology since that time the insect has only just been identified.—HUGH J. VINALL; Torbay, Park Road, Lewes, April 23rd, 1908.

HERMINIA DERIVALIS NOT AT BARMOUTH OR CHESTER.—For *Herminia derivalis* at Barmouth (Entom. xxxviii. p. 292), and at Chester (xli. p. 66), read *Zanclognatha grisealis* = *nemoralis*.—J. ARKLE; Chester.

LEPIDOPTERA OF EAST SUTHERLAND.—The following list is supplementary to that published (Entom. xl. p. 40):—*Selenia bilunaria* (*illunaria*), sparingly; *Odontoptera bidentata*, sparingly (very dark forms); *Amphidasys betularia*, fairly common (normal forms), out of many larvæ bred no black forms occurred; *Demas coryli*, fairly common; *Cidaria miata*, sparingly; *Hypsipetes trifasciata* (*impluviata*), common; *Hadena thalassina*, sparingly; *Cymatophora duplaris*, fairly common; *Coremia designata*, sparingly. Total of previous list of species 98, new additions as above 9=107 species.—M. A. ROLLASON; Jan. 1st, 1908.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, March 18th, 1908.—Mr. C. O. Waterhouse, President, in the chair.—Mr. Edwin Goldthorp Bayford, of 2, Rockingham Street, Barnsley; Mr. Edgar L. Clark, of Congella, Natal; Mr. G. W. Jeffrey, of the Alpine Gold Mining Company, Barberton, Transvaal Colony; Mr. G. W. Lawn, of Tudor House, Wealdstone, Harrow; and Mr. D. Langsdon, of 20,

Holland Park, W., were elected Fellows of the Society.—Dr. T. A. Chapman exhibited photographs of the empty egg-shells and young larvæ of *Papilio homerus*.—Mr. C. J. Gahan, a larva of the genus *Trictenotoma*. This larva belonged undoubtedly to the Heteromera, and bore most resemblance to the larvæ of Pyrochroidæ and Pythidæ. He also showed a larva of *Dascillus cervinus* from Ireland, which had been received at the Natural History Museum by Mr. Waterhouse, a species little known in this stage. The President said that the larva in question was just now the subject of experiment, it being reported as doing much damage to grass-land. It was important, therefore, to determine whether it was really destructive or parasitic on some other pest like *Melolontha*.—The President exhibited a photograph drawing of the larvæ of *Coniopteryx*, a small neuropteran common enough in its perfect state, but rarely found as a larva, when it may be beaten out of fir-trees.—Mr. W. J. Kaye, three species of *Pereute* from the Chanchamayo district of Peru, viz., *P. leucodrosime*, *P. calinice*, and *P. callianira*, together with specimens of the Nymphaline *Adelpha lara*. He called attention to the fact that these Pierines and Nymphaline occurred together at an elevation of from 2500 to 3000 ft. It was wrong to suppose that any *Heliconius melpomene*-like species entered the association, as *Heliconius* species of this pattern did not ascend to such an elevation, or, if they ever did, it was only as a rare exception.—Mr. L. W. Newman, a long and varied series of *Smerinthus populi*, bred from wild Bexley parents in June, 1907, the series ranging from extreme dark specimens (about six per cent.) to very light (about ten per cent.), and pink-shaded or tinged (about twenty per cent.), the remainder being intermediate forms. They included three gynandromorphic specimens.—Mr. J. W. Tutt asked for information from any Fellows who had collected abroad, relative to a suggested distinction of species in *Everes argiades*, Pall. He said that the question had been raised by M. Oberthür whether we have under *ab. coretus*, O., and *argiades* two separate and distinct species. A discussion followed, in which the Rev. G. Wheeler, Dr. T. A. Chapman, Mr. H. Rowland-Brown and other Fellows took part. Fellows having specimens in their collections were asked to bring series for comparison and discussion.—Mr. C. J. Gahan communicated a paper "On the Larvæ of *Trictenotoma childreni*, Gray, and *Melittomma insulare*, Fairmaire."

April 1st.—Mr. C. O. Waterhouse, President, in the chair.—Mr. F. B. Ackerley, P.O. Box, 459, Port Elizabeth, South Africa; Mr. Charles G. Clutterbuck, Heathside, Heathville Road, Gloucester; Mr. P. A. Clutterbuck, Indian Forest Department, Naini Tal, United Provinces, India; Mr. Walter W. Froggatt, F.L.S., Government Entomologist, New South Wales; Mr. H. A. Nurse, Botanical Department, Trinidad, B.W.I.; Mr. William Boulton Pratt, 10, Lion Gate Gardens, Richmond, Surrey; Mr. Edward Richard Speyer, Ridgehurst, Shenley, Herts, and New College, Oxford; Mr. G. Talbot, Vine Cottage, Raleigh Road, Enfield, N.; and Dr. F. Creighton-Wellman, Cuidado de Senhores Silva & Lopes, Benguella, Africa Occidental, were elected Fellows of the Society.—Mr. F. B. Jennings exhibited, on behalf of Mr. R. A. R. Priske, a melanic aberration of the stercorarius beetle *Aphodius scybalarius*, Fabr., taken at Deal in

June, 1907.—Professor E. B. Poulton, F.R.S., for Mr. E. E. Green, a preparation for the microscope of the tongue of *Ochromyia jejuna*.—Mr. E. R. Bankes sent, for exhibition, four specimens of *Hepialus humuli*, L., more or less covered by a sprouting fungoid growth, which was said by the editor of the 'Field' newspaper, in 1880, to be possibly an early stage of a species of *Clavaria*, and to have attacked the moths after death. Mr. Bankes had only met with eight lepidopterous imagines thus affected, all of which appeared to be referable to *H. humuli*. (2) Many dead larvæ of *Hepialus lupulinus*, L., infested with the fungus *Cordiceps entomorrhiza*, and received from Mr. W. H. B. Fletcher, in whose flower-garden at Bognor they had been found. The larvæ of this species prove destructive there, feeding on the roots of *Helleborus*, *Iris*, *Pæonia*, but the infested larvæ were only obtained from clumps of *Pæonia officinalis*. The larvæ were of two classes, some showing anteriorly much fibrous net-like mycelium growth, accompanied by a drumstick-like process often more than half the length of the larva; others showing no fungoid growth externally, and these work completely out of the soil and lie about on the surface.—Mr. J. E. Collin communicated "The Systematic Affinities of the Phoridae and of several Brachycerous Families in the Diptera," by Mr. W. Wesche, F.R.M.S.—Dr. T. A. Chapman, M.D., F.Z.S., read a paper on "*Stenoptilia grandis*, n. sp."—H. ROWLAND-BROWN, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 12th*, 1908.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. R. Adkin exhibited the Tortrices, *Hedya aceriana*, *H. ocellana*, *Grapholitha minutana*, and *Semasia woerberiana*, as common Metropolitan species, taken by him from fences on his way to and from the station.—Mr. Hy. J. Turner, four specimens of *Stichophthalma howqua*, a large species of Morphinae from Southern China, and specimens of the West African *Precis artaxia*.—Mr. Hugh Main, females of several species obtainable at the present time, with their ova, viz., *Hybernia progemmaria*, *Anisopteryx æscularia*, and *Phigalia pedaria*.—Mr. Andrews, the Diptera, *Pipiza lugubris*, a scarce Syrphid, and four examples of *Caricia tigrina* with its prey.—Mr. Joy, a collection of butterflies made by him near Calcutta during the last two seasons, and read notes.—Mr. Stanley Edwards, two species of scorpion, *Heterometrus swammerdami*, from India, and *Tityus insignis*, from the West Indies.

March 26th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Browne exhibited a large store-box of British Lepidoptera which he was presenting to the Society.—Mr. Tonge, some Lepidoptera recently received from Australia, including *Pyrameis kershawii*, and also a living specimen of *Xylocampa areola* (*lithorhiza*) taken that day.—Mr. R. Adkin, a series of *Scoparia truncicolella*, taken at Oxshott on pine-trunks.—Dr. Chapman, a living, nearly full-fed larva of *Aricia agestis* (*astrarche*), which had fed up indoors. Dr. Hodgson, sketches of the resting attitude of *Adopæa flava* (*thaumas*), and read notes.—Mr. Turner, some two dozen species of butterflies characteristic of Sierra Leone and West Africa, including several species of *Euphaedra*, *Aterica*, and *Acræa*, *Hypolimnias egesta*, *Amauris*

niavius, *Mylothris rhodope*, *Lachnoptera, iole*, *Salamis anacardi*, *Precis octavia*, *Catuna cænobita*, *Vanessa harmonica*, &c.—Mr. Sich exhibited and read notes on the section of the genus *Tinea*, containing *T. fulvimitrella*, *T. arcella*, *T. corticella*, *T. parasitella*, *T. picarella*, *T. granella*, *T. cloacella*, *T. albipunctella*, *T. caprimulgella*, *T. nigripunctella*, and *T. confusella*.—HY. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held *February 17th*, 1908, at the Royal Institution, Colquitt Street, Liverpool.—R. Wilding, Esq., in the chair.—Mr. W. Mansbridge, F.E.S., read a paper entitled "Variation in Lepidoptera," in which he enumerated the different classes of variation as generally understood by lepidopterists, and referred especially to a phase of variation which has not evoked the amount of interest its importance warrants, *viz.* colour changes from yellow or ochreous to red or brown and modifications of these.—The author considered these variations as proceeding upon parallel lines to melanism and probably arising in a similar way; first by variation from a commonly occurring form in the Darwinian sense, and secondly by mutations or sudden leaps in the sense enunciated by De Vries.—Putting on one side the first as more or less affecting all species, the author showed how practically all definite melanic forms falling in the second class (of which we have records) have, when first noticed, been of very local occurrence—as the majority still are—a few only having spread in comparatively recent times over large areas, and noted when this had been the case that the particular species, e.g. *Tephrosia biundularia* var. *delamerensis*, *Amphidasys betularia* var. *doubledayaria*, *Hybernia marginaria* var. *fuscata*, and *Diurnea fagella*, black forms, are common and generally distributed, so that transported specimens could easily continue their race wherever they might be carried.—The author broadly classes all instances of melanochoism and leucochoism as Darwinian modifications, and all cases of melanism and albinism as well as yellow to red, or red to yellow, and similar changes where the break is sudden, as mutations or De Vriesian variations, and concludes that they have arisen in this way and then increased and spread, or *vice versa*, accordingly as local conditions were favourable or the reverse.—A capital exhibition of varieties of local forms of Lepidoptera was made by the members in illustration, and a discussion ensued, in the course of which Messrs. F. N. Pierce, Dr. J. Cotton, Dr. Tinne, Robert Tait, junr., Dr. Wm. Bell, and R. Wilding concurred generally in the views set forth in the paper.

March 15th, 1908.—Mr. R. Newstead, A.L.S., Vice-President, in the chair.—The evening was devoted to an exhibition of *Boarmia repandata* and its varieties. Long series of the moth from various localities, chiefly from the North of England and from Wales, were shown by Mr. Robert Tait, junr., Mr. C. F. Johnson, and Mr. Wm. Mansbridge. The rich dark mottled forms from Delamere Forest; the greyish-white blotched race with the locally rare melanic aberration, also with white blotches, from Penmaenmawr; melanic varieties from Mansfield and Huddersfield; as well as absolutely black aberrations from Knowsley, Lancashire; the common London forms from Epping Forest and Wimbledon; var. *conversaria* from North Cornwall and New

Forest; besides series of pale-coloured moths from various localities were all represented in the above exhibits. A discussion ensued in which the members gave their experiences with *B. repandata*.—Mr. Tait stated that in breeding from extreme forms about seventy-five per cent. followed the parents, but pointed out that he had found it difficult to get black varieties to pair. He also remarked how closely the predominating pale form from North Wales resembled the bare rocks upon which it rested in the daytime.—Mr. Johnson, in his series from Maer Wood and Burnt Wood, Staffs, remarked on the great difference shown by the species in these two localities, only four miles apart; those from the former locality being chiefly very dark greyish-black, while the latter place gave a lighter and much browner form.—Mr. Charles Capper, London, sent a series of *B. repandata* from Wimbledon, and a series of *H. leucophæaria* from Richmond Park for exhibition.—Mr. Newstead brought four drawers showing the life-history of the Tsetse Flies (*Glossiniæ*), being the unique series of these flies from the museum of the Liverpool School of Tropical Medicine. This very interesting exhibit attracted a large amount of attention, and, in answer to questions, Mr. Newstead alluded to the chief points in the economy of these flies.

April 13th.—Mr. R. Newstead, A.L.S., in the chair.—The chairman delivered a lecture entitled "The Bionomics of Mosquitoes," in which he dealt with the subfamilies Anophelinae and Culicinae; he described the Anopheline genera *Anopheles* and *Pyretophorus*, contrasting them with the Culicine genera *Culex* and *Stegomyia* in a very clear and thorough manner. Mr. Newstead illustrated the lecture by blackboard drawings and by the following exhibits:—Living larvæ and pupæ of *Corethra* and *Culex*: a case showing the complete life-history and distribution of *Stegomyia calopus*, the mosquito which transmits yellow fever; and the following species concerned in carrying filariæ, which not uncommonly cause the condition known as elephantiasis, viz. *Culex fatigans*, *Pyretophorus costalis*, *Myzomyia rossi*, *Mansonia africanus*, and *Stegomyia fasciata*. The remainder of the evening was devoted to an exhibition of *Hydræcia nictitans*, *H. lucens*, and *H. paludis*, most of the members present having brought their series of these moths. The discussion was opened by Mr. F. N. Pierce, who showed preparations of the genitalia of the three species named above under the microscope, as well as of the new species brought forward by the Rev. C. R. N. Burrows, of Mucking, at a recent meeting of the City of London Entomological Society. Mr. Pierce demonstrated that the genital ancillaries are markedly different, and fully support the view that we really have four distinct species confused under the name *nictitans*. Mr. Pierce also showed photographs of genitalia of *Retinia buoliana* and *R. pinicolana*, clearly proving these two insects to be distinct.—Other exhibits were:—Mr. W. Mansbridge, a series of *Zygena achilleæ* from Argyll, with *Z. minos*, from Wales, for comparison. Mr. F. N. Pierce also showed *Z. achilleæ*, from the Continent, with many other species of the genus.—Mr. W. A. Tyerman, a bred series of *Amphidasys strataria*, from Delamere, the females especially being very dark and heavily banded.—Mr. Mounfield, of Warrington, in addition to his very fine series of *H. nictitans*, *lucens*, and *paludis*, a very dark brown form of *Drepana falcata*, pale

and dark forms of *Hadena adusta* and *Macaria liturata* var. *nigrofulvata*, all from Delamere; also varieties of *Abraxas grossulariata* from Warrington. — H. R. SWEETING & WILLIAM MANSBIDGE, *Hon. Secs.*

RECENT LITERATURE.

1. *Annals of Tropical Medicine and Parasitology* (Series T. M. vol. i. No. 3). University of Liverpool. November, 1907. This is an excellent number, containing twenty-three beautiful plates (sixteen coloured), and illustrations in the text. Though no paper deals with insects directly, some of their parasites (Trypanosomes, for instance) are treated of.
2. *Dragonflies (Odonata) collected by Dr. D. H. Atkinson in Newfoundland, with Notes on some Species of Somatochlora*. By E. B. Williamson ('Entomological News,' April, 1906). Two good plates accompany the paper.
3. *Copulation of Odonata*. By E. B. Williamson ('Entomological News,' May, 1906). This paper contains an excellent plate.
4. *Dragonflies (Odonata) of Burma and Lower Siam.—II. Subfamilies Cordulegasterinæ, Chlorogomphinæ, and Gomphinæ*. By E. B. Williamson (Proc. of U. S. Nat. Museum, December 13th, 1907). This is not a mere list; it contains good notes, especial attention being given to wings and wing-venation. Part I., on the *Calopteryginae*, was published in 1904.
5. *On some Earwigs (Forficulidæ) collected in Guatemala by Messrs. Schwarz and Barber*. By A. N. Caudell (Proc. U. S. Nat. Museum, October 23rd, 1907).
6. *Notas Zoológicas*. By R. P. Longinos Navás, S.J. (Boletín de la Sociedad Aragonesa de Ciencias Naturales), November and December, 1907. An illustrated paper on eight new Spanish insects or varieties. The descriptions are in Latin.
7. *Tricópteros nuevos*. By R. P. Longinos Navás, S.J. (Boletín de la Real Sociedad española de Historia Natural), December, 1907. Illustrated Latin descriptions of three new caddis-flies (not Spanish).
8. *Neuróptero nuevo de Montserrat*. By R. P. Longinos Navás, S.J. ('Revista Montserratina'), December, 1907. An illustrated Latin description, with notes in Spanish, of *Psocus hilaris*, Nav.
9. *Neurópteros nuevos*. By R. P. Longinos Navás, S.J. ('Memorias de la Real Academia de Ciencias y Artes de Barcelona'), Barcelona, 1908. A copiously illustrated paper of twenty-five pages. Though the notes are in Spanish, the author has again favoured us with Latin descriptions of the twenty-nine new species treated in the paper. Nearly all belong to the Planipennia.

W. J. LUCAS.

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THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

WITH the possible exception of the black-and-white "skippers," there is probably no group of European butterflies which causes more difficulty than those species of the genus *Melitæa* which are usually grouped round *athalia*. No doubt it is, as a rule, easy enough for any one with a slight acquaintance with the various species to separate them, when the individuals are few in number and the localities restricted; but when long series from many and widely separated localities are examined (and frequently with only fragmentary data, or none at all, attached to them), the difficulty of separating the species and of naming all specimens correctly becomes almost insuperable. For this difficulty two principal causes are responsible: first, the close resemblance *inter se* of the different species, and, secondly, the very great range of variation in each species, though always within certain definite limits. But it is the combination of these two difficulties which makes this group of almost unequalled biological interest amongst European butterflies; for we have here exactly the condition of things which was long ago laid down by Darwin ('Origin of Species,' chap ii.) as that in which it is easiest to see species as it were in the making. If species have been evolved from previously existing ones, it would be a most remarkable circumstance if we could find no examples of the process taking place under our eyes; yet the majority of collectors (if not even of naturalists) who give an unhesitating assent to some theory of evolution, seem to expect to find it possible in all cases to say with certainty to what species any given insect belongs; disregarding in practice the possibility, nay, the extreme probability, that amongst the number of the European butterflies, many of which are very variable, some few may be expected to exhibit the process of species-making, or, in other words, to afford instances of species not yet absolutely differentiated from each other, and to certain individuals of which it is therefore impossible to assign with certainty the correct

name. I believe this to be the case with the genus *Melitæa*, and pre-eminently so with that group of it associated with *athalia*, so that there will remain for generations to come a difficulty, no doubt in time a decreasing one, in finding differentiating characters between the species which will hold good in every instance; nor must we even be surprised if we find individual members of one species (when circumstances, such as rearing from one batch of ova, leave no room for doubt as to their identity) occasionally exhibiting one or more of the very characters which we are accustomed to regard as distinctive of another species, the whole genus being still in a condition of flux sufficient to lead to frequent instances of atavism. It is not then with any expectation of finding unerring rules by which it can be decided in all cases: "this is *parthenie*; that is *athalia*; this *deione*," and so forth, that I venture to publish the results of my studies in this group—studies extending over many years in the field and amongst collections, and over months among books—for I believe this to be in the nature of things impossible; all that I can hope for is to show by what distinguishing marks the various species may, *as a rule*, be recognized, and by adducing as large a number of these as I can find for each species, to make it more unlikely that *all* will be found, even in the most aberrant examples of another species than that to which they normally belong. Incidentally I hope to rouse an interest in the great biological question involved, in some collectors whose attention has not been attracted previously in that direction.

To make our enquiry as exhaustive as may be, it seems necessary to go back to the original descriptions and to trace the way in which the various species have gradually been recognized as distinct. Linnæus, in the tenth edition of his 'Systema Naturæ,' published in 1758, includes all the Melitæid forms known to him, with the exception of *maturna* in his description of *cinxia*, which reads as follows: "Papilio alis dentatis fulvis, nigro variegatis, subtus fasciis tribus flavis." Four years later Geoffroy, in his 'Histoire abrégée des Insectes qui se trouvent aux environs de Paris,' 1762, first separated them into "varieties," which he thus characterizes:—

1. "Papilio alis dentatis fulvis, nigro maculatis, subtus fasciis tribus flavis."
2. The same, except "nigro *reticulatis*" instead of *maculatis*.
3. The same, except "nigro *reticulatis et punctatis*."
4. "Papilio alis dentatis fulvis, nigro *reticulatis et punctatis*, *utrinque* fasciis tribus flavis."

The next step was taken by Rottemburg ('Naturforscher,' vol. vi. p. 5, 1775), who named these "varieties," and recognized them as distinct species, and from him we get the names *athalia* as applied to the second, and *aurinia* as applied to the fourth. The first and third he calls respectively *cinxia* and *pilosellæ*. For

the first he refers to an illustration in Rösels, vol. iv. plate xiii., figs. 6 and 7, which does not however represent what we understand by *cinxia*, but *didyma*. It is certainly a very dull *didyma*, but all doubt as to its identity is set at rest by the fact that Rösels also illustrates the larva (natural size and enlarged) and the pupa, the former of which, at any rate, is unmistakably *didyma*. On the same plate he also illustrates the larva and pupa of *aurinia*, but a reference to the text shows that the butterfly represented was produced by the upper larva, certainly *didyma*. Rösels, however, was not incapable of making a mistake in such a matter, as we shall see. He was a keen and enthusiastic naturalist (and I should judge a delightful personality), but not in any sense a systematist, and he makes no attempt to name the insects he has figured. At the time when he published plate xiii. and its accompanying text, the butterfly had not yet emerged from his second pupa, but he could not wait for its emergence to illustrate the earlier stages; and, besides, it might never emerge at all! However, it did, and he illustrated it on plate xviii. and it turned out to be *cinxia* in our sense of the name, i. e., the *pilosellæ* of Rottemburg! Later on he obtained some genuine *cinxia* larvæ, which he illustrates on plate xxix. These, to his surprise, produced butterflies identical with that illustrated on plate xviii. One can only suppose that he had failed to notice the red head and legs of the caterpillar which he has so painted as to make it look like *aurinia*, though this seems unlikely, as he draws attention to the difference. This serves to illustrate the difficulties to be encountered in tracing the history of these names, but as we are now only considering the *athalia* group, we are not at all concerned with Rösels, fascinating as he is, and only with Rottemburg in so far as he was the first to give a specific name to any member of this group, and this being *athalia*, we must regard the other species as having (for the most part, at any rate) been gradually separated off from it. The original description might include any of the group, even *dictynna*, when we come to the form of the Pyrenees, and probably *aurelia* is the species which most completely answers to the expression "reticulata"; but Geoffroy's book was on the insects taken in the neighbourhood of Paris, where *aurelia** does not occur, so that he no doubt refers to the

* Mr. Wheeler is apparently incorrect in stating that *aurelia*, Nickerl, does not occur near Paris. For in a MS. list, kindly lent me by Mr. W. G. Sheldon for my researches in the distribution of French Rhopalocera, Mr. Henry Brown states that this butterfly occurs in the Department of Seine-et-Oise at Lardy, and Seine-et-Marne at Fontainebleau. The late M. Th. Goossens, in his "Iconographie des Chenilles" (Ann. Assoc. des Naturalistes de Levallois-Perret, 1900, p. 9) also gives Lardy as a locality for the species. But it would be useful to compare the northern French specimens with examples from the Alps before pronouncing authoritatively whether they are identical with the *aurelia*, Nickerl, we know in Switzerland, and in other Central European habitats.—H. R.-B.

insect which we still—rightly—call by Rottemburg's name, *athalia*.

The next species to be separated off was *parthenie*, by Borkhausen, in 1789. He perceived the nearness of this species to *athalia*, though he actually separated it off from *trivia* (a member of the *cinxia* group), under which name he had received it from Vienna. The original description of Borkhausen reads as follows:—"Papilio alis subdentatis fulvis, nigro fasciatim maculatis; anticis ad marginem superiorem nigro annulatis, posticis prope apicem lunatis; subtus fasciis tribus flavescentibus nigro inductis, media divisa." (He also gives it in German.) He remarks that he bred a specimen from a caterpillar found near Darmstadt, and afterwards found more specimens of the butterfly. The size of these presents great difficulties. He states that some were no larger than *argus*, and the largest—all females—only as large as *lucina*. He found them late in the autumn, so, obviously, they were a second brood; and though the second brood in Switzerland barely differs at all in size from the first, it does not follow that this would be the case so much further north.* His account of his specimens certainly tallies with ordinary *parthenie* in other respects. Borkhausen remarks that he gave his caterpillar (which he very inadequately describes) no food, which might account for the size of his bred specimen, but hardly for that of his captured examples. *Parthenie* is illustrated by Godart (1823), much in accordance with the original description; it is *very* small. Indeed both description and illustration seem to refer rather to *varia* in size, which, however, can hardly have been taken near Darmstadt. There is an excellent illustration in Herrich-Schäffer (1843), to the palpi of which Rühl objects, though they are only very slightly too dark in either of the copies with which I am acquainted. To this illustration Keferstein refers in the Stettin 'Entomologische Zeitung,' 1851, p. 244 (not p. 224 as given by Rühl), in giving a description of *parthenoides* as he calls it, the name being thus synonymous with Borkhausen's *parthenie*. The figure of "*athalia minor*," given by Esper, pl. 89, fig. 2 (1829), and referred by Rühl to *parthenie* but by Staudinger to *aurelia*, is pretty bad, but less unlike *varia*, I think, than any other. Hübner's *athalia minor*, pl. iv. figs. 19 and 20 (1805), is indubitably *aurelia*.

Dictynna was first described by Esper in the first volume of his 'European Butterflies,' p. 382, in 1777, as follows:—"Alis dentatis fuscis, fulvo maculatis, subtus fasciis tribus albis, media bis dissecta." He also gives (pl. xlviii. fig. 2, *a* and *b*) figures both of the male and female. The upper side of the male is fairly good; on the under side the black lines of the fore wing are much too straight, and the other markings unrecognizable,

* It is significant that when *athalia* occasionally produces a partial second brood the specimens are extremely small.

the hind wing is tolerably good, but the black spots in the dark band are much too near the top of the lunules. The female, though it could not represent any other species, is distinctly bad. It is unfortunate that the description, "*media bis dissecta*" must have been taken from an unusually light specimen, in which what is really the upper division of the outer dark band was so lightly coloured as to appear to belong to the central light band, giving it the appearance of being divided into three parts transversely. Out of hundreds of specimens which I have examined, there are certainly not a dozen in which this is the case. Bergstrasser depicts it under the name *maturna* in 1779, in his 'Nomenclatur,' vol. iii. p. 78, and makes objections to the original description of *maturna* on the ground of the absence of red! (which is presumably what is meant by "*purpurascens*"); real *maturna* he figures on pl. 75 under the name *agroptera*, and as a form of *cynthia* on pl. 80; indeed, I find it very difficult to take Bergstrasser seriously, in spite of the reverence with which some modern entomologists appear to regard him. The names, by the way, can only be found by reference to the text; they are not given on the plates. Hübner's *corythalia* apparently also represents *dictynna*; it is illustrated in vol. i. pl. 3, figs. 15 and 16, and the under side is passably good. Hübner's "*dictynna*," pl. 14, fig. 10, is called by him "*Brenthis dictynna*," and represents *ino*. Esper, in giving his original description, speaks of *dictynna* as having been up to that time included with other species in *cinxia*. He expresses some doubt whether Geoffroy's fourth variety, named *aurinia* by Rottemburg, may not have represented this insect, but decides, undoubtedly rightly, against it. The name *dictynna* had, as he says, been given by Schiffermüller in his 'Verzeichniss,' p. 179 (1776), to some Melitæid form, but without any description, and he adopts it for the insect that he figures and describes. There has never since been any question (except apparently in the mind of Bergstrasser, who in his other book seems to have regarded it as a variety of *athalia*) as to its specific value.

Deione is first mentioned by Hübner at the foot of an excellent illustration in 1805, figs. 947-950, but the unfinished letterpress does not arrive at a description of it. The first description, with another good illustration, is by Duponchel in 1832, in his 'Papillons de France.' This is what he says about it: "Cette Melitée fait le passage de la Phœbé à l'Athalie. En dessus elle offre le même dessin que celle-ci, avec cette différence que la bande du milieu et les lunules terminales des quatre ailes sont d'un fauve plus clair que le fond. En dessous elle ne diffère de la première que parceque les lignes noires qui cernent les taches et les bandes des ailes inférieures sont plus fines, en même temps que le fond de ces mêmes ailes est d'un jaune plus pâle et que les nervures en sont noires, tandis qu'elles sont

jaunes dans la Phœbé"* (Dup. 'Papillons de France,' p. 276). Herrich-Schäffer, judging from Hübner's illustration, considered it a variety of *parthenie*, a much more possible suggestion than Staudinger's connection of it with *athalia*. The under side at once separates it from both, and connects it, as Duponchel says, with the *cinxia* group, and both larva and pupa are abundantly different from either, a fact which settles its specific value, a matter to which we shall have to refer later; the Spanish specimens and the Swiss form, the misnamed *berisalensis*, have greatly added to the difficulties connected with this species.

DRAGONFLIES FOR THE CABINET.

By W. J. LUCAS, B.A., F.E.S.

By the beginning of June the dragonfly season has commenced in earnest, and it may be that some entomologists who would like to collect and study the Odonata are deterred by the idea that they cannot keep specimens of these insects in as unchanged a condition as they can those of beetles or Lepidoptera. Nor is this wish to secure a presentable set of specimens of necessity a sign of the "mere collector," for every naturalist who desires that his statements may bear the stamp of accuracy must possess a sufficiency of good specimens for continual reference and comparison.

To a certain extent this widespread idea, that the colours of dragonflies are evanescent, is correct, the colouring matter being situated in a part of the insect quite different from that in which the colours of Lepidoptera reside. But this evanescence is not by any means so general as is usually supposed, when a few simple precautions have been taken. There are, in fact, many dragonflies in which the colours remain practically as fine as they were when the insects were alive.

It will be found too that in some individuals the colours remain after death much more true than in others of the same species, and in cases where the insect is a common one, a selection will enable the one interested to gradually obtain a good series. This as a matter of fact is practically all that can be done in the case of the very small species which are too delicate to be eviscerated.

* This *Melitaea* forms a transition between *phæbe* and *athalia*. On the upper side it shows the same design as the latter, with this difference that the central band and the terminal lunules of the four wings are of a lighter fulvous than the ground colour. On the under side it only differs from the former in that the black lines which bound the spots and bands of the lower wings are finer, and also that the ground colour of these wings is of a paler yellow, and the nervures black, while they are yellow in *phæbe*.

What had best be done in the case of all the larger species—large enough, that is, for easy manipulation—is to eviscerate them and then dry the shell, having stuffed it with cotton-wool, or not, according to the fancy of the operator. The insect should first be fastened down on its back on a sheet of cork, with very fine pins at the thorax and last abdominal segment near the appendages. Then with a pair of sharp-pointed scissors a slit must be made from the second (third in the male) segment to the eighth, thus leaving intact those bearing the genitalia. Now with a pair of fine-pointed forceps the contents of thorax and abdomen must be carefully removed. Usually most of this comes away at once, at any rate from the thorax. If not, while the rest is being removed, great care must be exercised lest the inner surface of the shell should be damaged, for on this in many cases is to be found the pigment to which the colouring is due. This is all. The abdomen may now be filled with a *very* little cotton-wool, or it may be dried as it is. The markings will now remain, and the colours to a greater or less extent, sometimes almost perfectly, and, of course, there are other elements of beauty besides colour. At any rate, a cabinet of dragonflies which have been so treated makes as fine a show as a cabinet of butterflies and moths.

If the preservation of colour is sought for scientific purposes only, the dragonflies should be put in good spirit, where their colour usually keeps excellently, except perhaps that of the blue-powdered species such as *Libellula depressa*. Indeed, it has been suggested that the small species which cannot be eviscerated should be put in spirit for some time, and then be relaxed and set. It is doubtful, however, if this is so successful a method as was supposed, and specimens dried in spirit are often very difficult to relax, especially if they are not thoroughly mature.

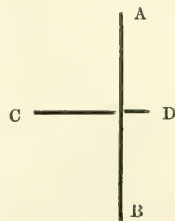
Just as with Lepidoptera, dragonflies that have not been eviscerated are liable to grease, with the same dire effect upon their colours, and this grease it does not seem so easy to remove with solvents such as benzine, or at any rate its effects are more permanent. Mould, mites, moths, and beetles must be guarded against by the use of naphthaline and by the other ordinary methods.

Usually the colours of the following British species keep excellently, often even without eviscerating:—males of *L. depressa*, *L. fulva*, *Orthetrum cancellatum*, and *O. cærulescens*; both sexes of *Cordulia ænea*, *Somatochlora metallica*, *S. arctica*, *Oxygastra curtisii*, *Cordulegaster annulatus*, *Gomphus vulgatissimus*; many examples of *Æschna mixta*, *Æ. juncea*, *Æ. cyanea*, *Æ. grandis*, and *Æ. isosceles*. But individuals in this last genus vary in this respect, and those seem to keep much better which are caught late in the season. The two beautiful species

Calopteryx virgo and *C. splendens* retain their colours excellently—and luckily, for they could scarcely be eviscerated. The same may be said of *Lestes sponsa* and *L. dryas*, and to a great extent of *Pyrrhosoma nymphula* and *P. tenellum*. One important point to notice is that as time goes by the specimens in the cabinet tend to regain their colours rather than the reverse. There is little doubt that dragonflies keep their colours better if they have had no food for some time before being killed.

Setting is an important matter in the case of dragonflies, for there are the legs and abdomen to attend to as well as the wings. After having been killed in the cyanide-bottle, they should be pinned through the thorax, care being taken that the pin does not bring away a leg when it comes through the under surface. For uniformity's sake the costal margin of the two hind wings had better form one straight line at right angles to the main axis of the insect, and the hind margin of the fore wings should just not meet the hind wings. In the Anisopterids the anal angle of the hind wings should be supported while drying. Flat setting-boards *must* be used. Also there must be a groove wide enough to allow of the legs being properly arranged, and deep enough to keep all parts of the set insect from the paper in the cabinet-drawer. In life all six legs are turned forward, but most collectors, not only for appearance sake but also for facility of observation, will not arrange them so. Usually the fore legs will be put forward, the hind ones backwards, and the mid ones more or less at right angles to the thorax. Perhaps the legs look better, and they certainly take up less room, if they are bent at the joints—not stretched out straight. While drying, legs and abdomen must be kept in position with pins and braces; and the head, if not controlled, will usually tend to look over one shoulder or the other in a very idiotic fashion. Labelling must be done carefully, as the ticket shows when placed beneath the insect. The drying process is rather slow, two or three weeks at least being required for the larger species.

When obtainable empty nymph-skins should accompany the perfect insects. These are very ethereal and will seldom bear a pin; a good method of mounting them is near the end of a very thin strip of card, c D, at right angles to the length of the nymph-skin, A B. The whole is secured in the cabinet-drawer by a pin passing through the card at c, the pin also bearing the label. It is quite easy to gum the skin at D without hiding any important structures.



PYRAMEIS CARDUI AND THE JUNE RAINFALL
OF 1906.

BY ROBERT ADKIN, F.E.S.

THE influence of meteorological conditions upon our alien lepidopterous fauna is a subject of deep interest, but it is an exceedingly complex question, and so beset with side issues, each capable of exerting an influence for good or evil, that one is in the majority of instances reluctant to assign cause to effect. Occasionally, however, some special circumstance appears to stand out so clearly that whatever possible explanations might be given, we may, with some measure of certainty, fix upon it as a well-defined cause for some particular phenomenon. The failure of the multitudes of *Pyrameis cardui* that appeared on our southern and south-western coasts in the spring of 1906 to produce a corresponding abundance of the species in autumn appears to be a case in point, the assumption being that the exceptional weather conditions prevailing at a critical time in the species development was the cause of the failure.

The available records show that the species was met with sparingly in many places near the south-east and south-west coasts during the last week in May. There can be little doubt that the individuals then seen were the early arrivals of a great immigration which struck the Kent and Sussex and the Cornish and Devon coasts on June 2nd and 3rd and spread inland, distributing themselves over the southern portions of the country; those arriving on the Cornish and Devon coasts apparently taking a north-easterly course along the Bristol Channel and were traceable as far as the southern parts of Monmouthshire, while those which reached the Kentish and Sussex coasts appear to have spread themselves out over the south-eastern counties and the London district.

The weather over the southern portions of England during the greater part of the month of June was fine and suitable for the butterflies' egg-laying, the range of temperature being fairly high, with a full amount of sunshine and small rainfall. But on the night of the 28th practically the whole of England south of a line drawn from the Bristol Channel to the Wash was visited by a cyclonic rain of exceptional violence, an area of approximately twenty-two thousand square miles receiving from one to two inches of rain, while within this a roughly triangular patch having its apex near Wisbeach (Cambs) and its base extending from near Croydon (Surrey) to Wallingford (Berks), an area of some two thousand six hundred square miles, received from two to upwards of two and a half inches of rain, practically the whole of which fell within twelve consecutive hours. To put the matter briefly: the southern half of England received in the space of a single night an amount of rain equal to that

which falls on an average throughout the whole month of June. The fall was accompanied by an easterly or north-easterly wind, and the reduction in temperature was scarcely less remarkable than the heavy rainfall.

It is practically certain that the butterflies which were observed on the coasts at the end of May and during the first two or three days of June, would have deposited their eggs as they passed inland, and that the heavy rainfall came just at the most critical time in the insects' existence, namely, when the young larvæ were just leaving or had just left the eggs, and when they would be least able to withstand its severity; the inference being that a very large proportion of them were overcome by the phenomenal rainfall and perished.

A NEW SUBGENUS OF AFRICAN BEES.

By T. D. A. COCKERELL.

THE leaf-cutting bees, forming the genus *Megachile*, exist in practically every part of the world where there is vegetation, with the exception of New Zealand. More than seven hundred species have been described, and new ones are added every few months. This enormous group, as might be expected, is far from uniform, and various attempts have been made to divide it up. The segregates *Chalicodoma* and *Gronoceras*, distinguished both by their structure and their nest-building habits, seem to me to be very good genera. Others, especially some of the genera proposed by Robertson, are not so satisfactory, and it is not yet clear how many should be given full generic standing. It seems both justifiable and desirable, however, to distinguish the more striking groups as subgenera, leaving it for the future to decide how many of these deserve the rank of genera.

Creightonella, n. subg.

♂. Mandibles with the usual large tooth beneath; antennæ slender, normal; anterior coxæ spineless or with an indistinct rudiment; anterior tarsi rather thick but normal; claws deeply bifid; sixth abdominal segment produced, quadrate, keeled down the middle, with the projecting edge six-spined; seventh segment with a large thorn-like projection, the sides of which have three sharp edges, two lateral and one (on which are two little tubercles) posterior; hind margin of fourth ventral segment with a broad shallow emargination, on each side of which is a strong spine, directed posteriorly; in the interval between these spines, and a little posterior to them, are seen two other spines, slender and clear ferruginous in colour. Type, *M. mitimia*, n. sp.

Megachile mitimia, n. sp.

♂. Length about 15 mm.; black, rough with very dense minute punctures; legs entirely black, except that the claw joint is obscurely

reddish, and the claws have the basal half red; hind margins of abdominal segments, and the teeth on sixth segment, red; mandibles bidentate, the inner tooth rounded; clypeus not at all keeled, the punctures larger in the middle than at the sides, the anterior margin a little produced and truncate in the middle; hair of head and thorax dull white, not abundant, on posterior part of pleura it is reddish; tegulae ferruginous, fuscous basally; wings yellowish hyaline, apical margin a little darkened, nervures ferruginous; the scanty hair of legs mainly black or fuscous, but the tarsi fringed with bright fox-red hair; first two abdominal segments with much bright fox-red hair; hind margin of fifth segment and upper surface of sixth, rather thinly clothed with red hair; first two ventral segments with scattered reddish hair.

Hab.—Ekuiva Valley, W. Africa, at flowers of a native species of mint, collected (1907) by Dr. F. Creighton Wellman. The specific name means black and red in the language of the Sula Islands.

Another species of *Creightonella*, differing by the colour of the hair on the tarsi and ventral abdominal segments, &c., has been described by Fries (Zeits. f. Hym. Dipt. 1903, p. 273) as *M. sexdentata*. Unfortunately this name was used by Robertson in 1895 for an American species, so it will have to be changed. *M. mandibulata*, Smith, is also perhaps a *Creightonella*, but this cannot be definitely determined without an examination of the types.

It may be as well to record here that Dr. Wellman also took *Megachile ianthoptera*, Smith, in the Ekuiva Valley.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE RHYNCHOTA.

By W. L. DISTANT.

MR. KIRKALDY'S last disputation on names and words (*ante*, p. 123) has quite bewildered me. He writes: "In using *Leptocoris* I have simply selected the name which is proper under the rules followed by every living hemipterist but Mr. Distant." As Dr. Bergroth is still living (and we all hope will live for many years to come), that statement seems inaccurate. If he is not living, as I absolutely disbelieve and have proof in a recent letter to the contrary, what is the meaning of the sentence: "It is because Bergroth is so strict an observer of the law that I feel sure he would now use *Leptocoris*"? Dallas's work may be "nearly sixty years old," but if Mr. Kirkaldy had referred to it and studied the genus rather than the name which represents it, he might have avoided redescribing the form *Serinetha taprobanensis*, Dall., as *Leptocoris bahram*, Kirk. However, we all make mistakes.

In proposing new names for preoccupied generic ones, Mr. Kirkaldy seems to be unfamiliar with his subject. Thus he proposes the name *Bæria* for *Panda*. It is quite true that in 1898 I used the preoccupied name *Panda*. But it is equally well known to most serious students that in 1899 the late Dr. C. Berg substituted for it the name *Tripanda*. Mr. Kirkaldy's *Bæria* is thus an unnecessary synonym. As he writes that he has a "Catalogue of the Hemiptera now in the press," it may perhaps be too late for him to accept an anticipatory correction, but the following is the synonymy:—

GENUS TRIPANDA.

- Panda*, Dist. Ann. Mag. Nat. Hist. (vii). ii. p. 299 (1898)
 nom. præocc.
Tripanda, Berg, Comun. Mus. Buenos Aires, i. p. 78 (1899),
 nom. n.
Bæria, Kirk. 'Entomologist,' 1908, p. 124.

NOTES ON BRITISH BRACONIDÆ.—VI.

BY CLAUDE MORLEY, F.E.S., &c.

(Concluded from p. 129.)

7. *pallidipes*.—This species has occurred to me on bushes in woods at Wherstead and Assington in the middle of July, and at Monks Soham, on a willow-leaf, in the middle of August, in Suffolk; Shere (Capron) and Greenings (W. Saunders), in Surrey; bred during the same year from a larva of some microlepidopteron collected on oak at Yarmouth, Isle of Wight, on June 10th, 1905 (Bankes). The cocoon is not described. It is cylindrical, white, quite transparent, $5\frac{1}{2}$ mm. long, and apparently pendent. Miss Chawner has given it me from the New Forest, together with the female, which had entirely removed one end in emerging.

8. *ictericus*.—This abundant species has never occurred to me in Suffolk, though I have found it in June at Carisbrooke, Isle of Wight; and possess many captured by Piffard at Felden, in Herts, and W. Saunders at Greenings and Reigate, in Surrey, from June to August.

9. *confinis*.—As I understand it, this differs very little from the last species. My four females were taken by Beaumont at Kilmore, in Ireland, in August, and Capron at Shere.

11. *obfuscatus*.—There is little to add to the summary of what is known of this species' economy given in Trans. Ent. Soc. 1907, p. 38. Since writing it I have taken many females walking over a large *Boletus*, doubtless tenanted by *Orchesia micans*, and

tapping it assiduously with their antennæ at Hulver Bridge, in Suffolk.

12. *punctiventris*.—Apparently uncommon. Bignell has given it me from Devon, and I have found it on reeds at Southwold late in September, and at Tuddenham Fen on June 12th.

13. *atrator*.—One female of this very distinct species was running on my bedroom window here at 6 p.m. on August 31st, 1907. It is said to prey on moths, and not *Cis boleti*.

15. *abdominator*.—A male was swept by me at Queens' Bower, Brockenhurst, in August, 1901. I also have a couple of females taken at Felden, in Herts, by Piffard, and at Golspie, in Scotland, on August 26th, 1900.

17. *melanostictus*.—Not hitherto bred. On May 29th, 1899, Haggart sent me its cocoon, which is nearly 6 mm. in length, elongate-ovate, somewhat shining, transparent, pale piceous, with darker reticulating strands, and exactly identical with that of *M. versicolor*, from Galashiels; he said it had emerged from the pupa of *Thera variata*. A female had emerged on 11th of the following month between midnight and 10 a.m., and had entirely removed the smaller end of the cocoon, which does not appear to be pendent.

18. *pulchricornis*.—This common species occurred to me in the Bentley Woods in 1894, and at Brockenhurst in May, 1895; Beaumont has taken it at Oxshott in July, and Harting in August. On May 23rd, 1900, a female emerged from its cocoon, which is smaller, paler, and much narrower than that of the last species, and has a "swing-rope" of 13 mm. This was sent me from Reigate by Prideaux on 11th inst., with the dead and shrivelled host—a larva of "what I could, with fair certainty, identify as *Agrotis agathina*, found on heather a week ago, and which developed the enclosed solitary cocoon. The larval host lived some days after its extrusion, apparently in great discomfort—incessantly writhing—but no further parasites were disclosed" (R. M. P. in lit.). When it came to me the host-larva was no longer than the Braconid's cocoon. Chapman also bred a female at Locarno or Cannes in April, 1900; and Miss Chawner has given me both sexes, bred in July at Burley, in the New Forest, from "hazel-leaves."

20. *scutellator*.—Both sexes given me by Piffard from Felden, in Herts, and by Beaumont from Kilmore, in Ireland, in August. I took a female on my study-window here in the middle of last August.

21. *unicolor*.—I have one male, probably referable to this species, from the New Forest.

23. *versicolor*.—On May 29th, 1899, Haggart sent me a cocoon and the larva-host, whence it had emerged, found on heather at Galashiels on 27th. This larva I sent to Barrett for determination, and he pronounced it, on June 5th, to be that of some

Tenthredinid. A female of the present species —var. *bimaculatus*, Wesm.—emerged between midnight and 10.30 a.m. on June 10th. A second female of the same variety emerged on Oct. 11th, 1899, from its cocoon. The latter had emerged from the body of a larva of *Bombyx rubi* when I received it on 21st of the preceding month from Rev. C. D. Ash, who took it at Selby, in Yorks. In both these cases the cocoon had no “swing-rope,” but were, as in Wesmael’s case, in confined quarters, which may, as suggested by Marshall, have accounted for the omission.

25. *filator*.—Tostock, in Suffolk, in late September (Tuck); Shere (Capron); New Forest (Miss Chawner). I have only met with females in quite late autumn, by beating *Picea excelsa* at the end of October, and once (November 2nd, 1902) I took two from quite inside a dead rabbit. It is said to affect fungi, which is known to often attract carrion beetles. In June, 1907, I swept a very large male of this species at Matley Bog, in the New Forest.

26. *cinctellus*.—Three ferruginous males in my collection can, I think, be nothing but this species or *M. decoloratus*, of which a unique German female is alone known; they were taken by Thornley at Scotton Common, in Lincolnshire; bred by Miss Chawner in the New Forest, from a cocoon like, but smaller than, that of *M. versicolor*; and swept by myself from rough grass in Wicken Fen, June 11th, 1902. They are, however, very untypical.

27. *tenellus*.—I swept a single female of this distinct species at Shalfleet, in the Isle of Wight, at the end of last June.

28. *rubens*.—Piffard has given me specimens of both sexes from the coast sandhills at Felixstowe, in Suffolk, and Beaumont took a male in a similar situation at Kilmore, in Ireland, in August, 1898. It is a gregarious parasite of *Agrotis vestigialis*, &c.

29. *læviventris*.—Females of this small species have been bred by Miss Chawner in the New Forest. The cocoon is cylindrical, dirty white, much more woolly at the anal half, and only $3\frac{1}{2}$ mm. in length.

30. *fragilis*.—This species, as I understand it, almost exactly resembles *M. punctiventris*, but with no tracheal grooves on the post-petiole. It is not uncommon. I have found it at Tuddenham Fen, Halesworth, Needham, Ipswich, and Moulton, in Suffolk, from May 15th to September 26th; and W. Saunders also took it at Greenings, in Surrey.

I shall at all times be most grateful for bred hymenopterous parasites, which I fear lepidopterists do not by any means value at their true scientific worth; this is quite as great as that of the hosts whence they emerge.

Monks Soham House, Suffolk: March 25th, 1908.

ON TWO NEW GENERA OF CHALCIDIDÆ FROM BORNEO.

By P. CAMERON.

ELEMBA, gen. nov.

Pronotum quadrate, of equal width, narrower than the mesonotum, wider than long. Mesonotum without parapsidal furrows, the mesosternum bordered by a distinct lateral furrow. Scutellum large, longer than wide, its sides bordered by a distinct crenulated furrow; it is not narrowed at the base; its apex rounded, only slightly narrowed, and with an oblique rounded slope. Head as wide as the thorax; the temples distinct, roundly narrowed. Head longer than wide; the malar space not quite half the length of the eyes, and with a narrow but distinct furrow above. There are two longish deep foveæ on the lower part of the face in the centre. Mandibles large, broad, short, furrowed in the middle at the apex, probably bidentate. Antennæ apparently twelve-jointed; the apical joint flattened, longer than the preceding; the front is excavated to receive the scape, and has a stout keel on its lower part. Abdomen distinctly narrower than the thorax, flat above, the basal two segments incised at the apex, of nearly equal length; the sheaths of the ovipositor broad, covered with stiff hairs, half the length of the abdomen. Legs moderate, the femora not dilated to any extent; the middle calcaria long, stout, the posterior short, slender. Marginal branch in fore wing elongate, gradually narrowed to near the apex of the wing; stigmal branch moderately long, curved, almost bifid at the apex. The antennæ are slender, the flagellum is of equal width; the first joint of the flagellum is more than twice longer than wide, twice the length of the following, which is shorter than the next. The basal joints of the flagellum are covered with short, stiff, black hair. On the apex of the mesopleuræ, above the middle coxæ, is a triangular space bounded by deep furrows. Tegulæ large, conchiform. Abdomen (not counting the ovipositor) is long, narrow, narrowed towards the apex, the sides not keeled. Eyes bare. Labrum hidden. The first abdominal segment is much longer than the others. The metanotum is not keeled; the centre is bounded by two furrows. The head is not narrowed in front.

This genus comes close to *Epistenia*, which may be known from it by the presence of parapsidal furrows, and by the basal abdominal segments being transverse, not incised.

Elemba levicollis, sp. nov.

Head and thorax dark blue, the apex of mesopleuræ and the metanotum green, abdomen dark purple above, the sides blue, the apices of the apical segments more or less coppery; antennæ black; legs black, the fore legs tinged with violaceous, the fore coxæ dark blue, the four hinder green, thickly covered with short white pubescence. Wings hyaline, broadly, slightly tinged with fuscous at the apex; the nervures black. ♀. Length, 11 mm.; ovipositor, 4 mm.

Kuching, October (John Hewitt).

Face strongly, deeply punctured, the part in the centre below between the furrows finely, closely punctured; the lower part of the sides of the front is smooth, with two or three large punctures in the centre; the upper is closely, transversely punctured; the central depression smooth, its upper part coppery tinted; the ocellar region is sparsely, weakly punctured and coppery tinted, the rest of the vertex is more strongly punctured. Upper orbits above weakly, below strongly punctured. Prothorax smooth. Mesonotum covered strongly with round deep punctures, the edges of the punctures sharply raised; down its centre is a dark violaceous band which becomes narrowed towards the apex. The punctuation on the scutellum is closer and runs into longitudinal striæ, the apex is closely, transversely striated. Metanotum in the narrowed centre with some striæ, the dilated sides depressed, smooth. Mesopleuræ strongly punctured above, more weakly below; the furrow at the base is widened and curves obliquely downwards; this down branch is wider than the longitudinal one and is smooth; on the apex the punctuation is finer and closer, and runs into striæ, this posterior part being separated from the rest by a shallow furrow. Back of abdomen smooth, the sides finely aciculated.

PENTACHALCIS, gen. nov.

Hind femora with three large and two small teeth. Middle tibiæ without spurs. Antennæ (including the ring-joint) twelve-jointed. Apex of scutellum with a distinct bluntly rounded projection, of which the sides and apex are clearly raised above the basal part. Metanotum untoothed, but with a small rounded projection on the lower part of the sides. Malar space long, nearly as long as the eyes. Abdomen sessile, not truncated at the base. Hind coxæ almost as long as the femora, which are longish oval; the penultimate joint of the hind tarsi is as long as the preceding two united, and is thicker than them; the femora extend beyond the apex of the abdomen. The antennæ are placed distinctly above the lower part of the eyes; the scape extends above the vertex. Marginal and post-marginal veins long, the latter much thickened; the stigmal branch short, thick.

Comes near to *Pseudochalcis*, Kirby. *Pentachrysis* is the sole described genus in the group with only five teeth on hind femora.

Pentachalcis erythronota, sp. nov.

Black; the mesonotum and scutellum bright red; the four anterior knees, the base and apex of the four front tibiæ, and all the tarsi of a duller, more testaceous red. Hind femora with three longish, clearly separated teeth on the base, and two short stumpy ones on the apex, the apical of which is broader than the penultimate. Wings almost hyaline, the apex broadly fuscous violaceous; the nervures black. Basal three antennal joints bare, shining; the others opaque, thicker, covered with a microscopic down, the fourth slightly but distinctly longer than the fifth. Face strongly, deeply punctured, more or less reticulated; in the centre of the face is a longitudinal keel, equally distant from the top and bottom; the vertex and sides of the front are similarly punctured-reticulated, as is also

the occiput. The outer edge of the outer orbits and the lower edge of the malar space are stoutly keeled, the latter being transverse. Pro-, mesonotum, and scutellum punctured-reticulated closely, but not quite so strongly as the face. Apex of scutellum ending in a projection, wider than long, depressed, its sides and apex stoutly keeled, the sides oblique, the apex transverse. Metanotum coarsely reticulated; the sides below end in a short rounded tooth. Pleuræ coarsely punctured, the mesopleuræ with a wide, smooth, oblique depression commencing below the tegulæ; its upper part is smooth; the base with a row of foveæ, the apex with a broken keel; the lower part is stoutly striated, the striæ being clearly separated. Abdomen smooth, the apical three segments strongly punctured at the base. The tibiæ and tarsi are thickly covered with a stiff white pubescence. ♂. Length, 6 mm.

Kuching (John Hewitt).

The ocelli prominent, in a curve. Mesonotum trilobate. The hind wings are faintly clouded at the apex.

NOTES AND OBSERVATIONS.

CADDIS-FLY EATING APHIDES.—Mr. Arkle would confer a favour on entomologists if he would secure a specimen of the caddis-fly that eats aphides (*antea*, p. 92), get it named, and describe the mouth-parts by which it performs this feat. — T. A. CHAPMAN; Betula, Reigate.

ABERRATION OF AMPHIDASYS BETULARIA.—Referring to Mr. Mansbridge's remark (*antea*, p. 112) that in the buff form of *A. betularia* obtained by the Middleton collectors the ground-colour of the wings is white, I may state that I have eight of those specimens, and that in no case is the ground-colour white but ochreous, like the variety he describes. — A. B. FARN; Breinton Lodge, Hereford, May 16th, 1908.

THE LONG LIFE OF SCOLIOPTERYX LIBATRIX.—On May 1st I took a specimen of *Scoliopteryx libatrix* at rest. It was in excellent condition, as, owing to its torpid habits, seems to be usual with this species whenever captured. But the date leads me to inquire if some of your correspondents will give the latest dates on which they have taken *libatrix*, in order to estimate the average length of life of the imago. My only note of breeding the insect is the emergence on August 9th, 1886, of a specimen from a pupa found by chance in collecting other things. This, however, suggests the possibility of ten months' hybernation in the perfect state for this species.—FRANK E. LOWE; St. Stephen's Vicarage, Guernsey.

FOOD OF GLOW-WORM.—On May 4th not far from Oxshott Station I picked up a specimen of the mollusk *Helix cantiana*, and on examining it noticed a glow-worm without wings (probably a larva)

inside the shell. To make certain that the insect was preying on the mollusk, I broke away carefully the large whorls of the shell in pieces till I found the remains of the snail towards the apex of the shell. I had always understood, though I had no definite knowledge, that snails were the food of the glow-worm, and was therefore pleased to catch one at its meal.—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames, May 10th, 1908.

LIFE-HISTORY OF *HESPERIA PANISCUS* (PALÆMON).—I think Mr. Rollason's account of the life-history of *H. paniscus* (*antea*, p. 102) calls for some correction, as he claims to have given a much more complete life-history than those published by Messrs. Buckler, Helins, and myself; whereas Mr. Rollason's history of the species is *very incomplete*, as he altogether omits the life of the larva during its earlier stages (excepting a very vague description of it after emerging from the egg). He also even does not refer to the number of moults, or anything relating to the larvæ from soon after hatching on June 21st until August 13th, during which period of time they were not examined, although he must have been aware of the fact that they would pass through different stages. He alludes to giving much fuller detailed descriptions of the fully-grown larva, as well as the pupa, and actually states: "I find my description of the larva in *various* stages is of much fuller detail in nearly all respects." These, however, seem to me to be unnecessarily lengthy, and I think the descriptions given by me of *every* stage to be full enough for all practical purposes. I refer to the complete life-history of this species I published in the 'Entomologist,' xxv. 1892, pp. 225, 254 (I may here take the opportunity of correcting a printer's error in line 16 from bottom, p. 226; the word "seventeen" should read "seven"). This was the first complete life-history published of *H. paniscus* (*palæmon*), and I believe I am correct in saying it remains so. Certainly Mr. Rollason's history of this species is very incomplete.—F. W. FROHAWK.

ENTOMOLOGICAL SOCIETY OF LONDON—CONVERSAZIONE.—What we believe to be the first reception of its kind by the Entomological Society of London was held in the rooms of the Civil Service Commission—formerly the London University Buildings—on the evening of Friday, May 15th. The somewhat chilly atmosphere of officialism which pervades the great examination schools had, however, been dispelled by the joint efforts of furnisher and exhibitors, and Fellows who only know the great hall, the vestibule, and the western wing generally under its customary aspect were agreeably surprised at the transformation effected. The former was reserved as a refreshment and conversation room, Miss Rosabel Watson's Ladies' Æolian Band performing selections of pleasant music during the evening, especial care being taken that the sounds should not penetrate to the theatre in which the several addresses kindly given by Mr. Donisthorpe, Colonel D. Bruce, C.B., F.R.S. and Professor E. B. Poulton, F.R.S., were to be delivered. The guests who numbered about two hundred and fifty were received by the President, Mr. C. O. Waterhouse, Miss Waterhouse, Prof. Poulton, and one of the Secretaries, and it is only to be regretted that many more had not accepted the

invitation of the Society, it being a matter of some congratulation, however, to those who did, that there was no undue crowding, either at the exhibition stands, or at the tables where the microscopes were installed.

Among the more important exhibitions we noticed the following :— Professor E. B. Poulton, F.R.S., Mimicry in American Papilios. Lt.-Col. N. Manders, R.A.M.C., Series of *Melanitis leda* taken at different seasons. Dr. G. B. Longstaff, Plants of *Bryophyllum calycinum*, a favourite resting-place of *Callidryas eubule* : Rest attitudes of Butterflies ; Flies mimicking Wasps ; Water-Grasshoppers. Dr. F. A. Dixey and Dr. G. B. Longstaff, Scents in Butterflies. The President, Illustrations of Tsetse and other biting Flies. Mr. E. A. Butler, Dimorphism in Hemiptera, and recent additions to the British List. Mr. R. Shelford, Insects preserved in Amber. Lt.-Col. C. T. Bingham, Nest of Wasp from Assam, with occupant attacking Spider. Mr. H. J. Elwes, F.R.S., Variation and Dimorphism in Indo-Chinese and Indo-Malayan Butterflies. Mr. W. J. Kaye, Heliconine Butterflies from British Guiana. Mr. W. F. Rosenberg, Rare Heterocera from South America. Mr. H. Eltringham, Mimicry in African Butterflies. Mr. O. E. Janson, Goliath Beetles. Dr. H. C. Phillips, Parasites on Lepidoptera. Mr. G. T. Porritt, Melanism in West Yorkshire Lepidoptera. Mr. C. P. Pickett, British Lepidoptera. Mr. L. W. Newman, Living British Larvæ and Pupæ. Mr. A. E. Sieh, Lepidoptera of South London. Mr. Selwyn Image, Lepidoptera observed within six miles of Charing Cross. Mr. R. Adkin, Local Variation in a common British species. Mr. A. H. Jones, The Genus *Anthocharis*. Miss M. E. Fountaine, Spring Butterflies of the Mediterranean Region. The Rev. G. Wheeler, Rare and variable species of Swiss Butterflies. Dr. T. A. Chapman, Homœochromatism in French Butterflies. Mr. A. W. Bacot, *Malacosoma neustria* and *M. castrensis*, and their hybrid forms. Mr. L. B. Prout and Mr. A. W. Bacot, Experiments in Mendelian Heredity with *Acidalia virgularia*. Mr. A. Hall and Mr. C. J. Grist, Mimetic Nymphaline Butterflies and their Models. Mr. S. Edwards, Morphos. Mr. J. A. Clark, Varieties of *Peronea cristana*. Mr. R. South, Aberrations of *Peronea cristana* and *P. hastiana*. Mr. H. St. J. Donisthorpe, Insects and other Forms associated with British Ants ; The British Ants ; Observation Nests of *Formica rufa* and *F. sanguinea*. Mr. A. Harrison and Mr. H. Main, Local Forms and Varieties of *Pieris napi* and *Aplecta nebulosa*. Mr. A. E. Tonge, Stereoscopic Photographs from Nature. Mr. H. J. Turner, Life-Histories of the Genus *Coleophora*. Mr. E. B. Nevins, British Aculeate Hymenoptera. Mr. H. Main, Photographs of Lepidoptera ; and the Obligation Book of the Society, with the signatures of the Duchess of Kent and the Princess Victoria, afterwards Queen Victoria.

A special word of praise is also due to Miss Garnet for her exquisitely minute and faithful water-colour drawings of Coleophorids, exhibited by Mr. Selwyn Image for Mr. Christopher Whall ; while the whole of two sides of the room were decorated with the drawings of varieties of British Lepidoptera in the collection of Mr. S. J. Capper by Mr. S. L. Mosley—a unique and instructive series.

The Smaller Room was entirely devoted to microscopic demon-

strations by Fellows, and others including Messrs. R. & J. Beck, Limited; Messrs. Ross, Limited; and Mr. Charles Baker; the demonstrations on the lantern-screen proving especially attractive, while Mr. F. Enoch in the Large Room was also surrounded at his microscopes throughout the evening by appreciative audiences, as well as Col. D. Bruce, F.R.S. who, with Capt. Hamerton, had a table covered with microscopic preparations to illustrate the chief entomological features of the Sleeping Sickness as demonstrated in the theatre.—H. R.-B.

CAPTURES AND FIELD REPORTS.

CAPTURE OF NOTODONTA PHÆBE = TRITOPHUS IN BEDFORD.—On May 13th, 1907, whilst collecting round the electric lights of Bedford, I took a specimen of *Notodonta phæbe* = *tritophus*. From Mr. South's latest book on the 'Moths of the British Isles' there appear to be only six other records of this moth or caterpillar having been taken in England.—W. S. BROCKLEHURST; Bedford, May 8th, 1908.

[I have seen the specimen noted above and find it correctly identified.—R. S.]

LAVERNA DECORELLA AT BLOXWORTH, DORSET.—The record of *Laverna decorella*, Steph., noted in the 'Entomologist,' vol. xxxi. p. 104, was found subsequently to be erroneous. The moth mistaken for it at the time was *L. hellerella*, Dup. I may mention that *L. decorella*, Steph., occurs here regularly but rarely.—(Rev.) O. PICKARD-CAMBRIDGE; Bloxworth Rectory, Dorset.

LARVA OF CIRRHÆDIA XERAMPELINA.—Having been very successful in obtaining larvæ of *C. xerampelina*, my method may be of interest. Briefly, the method is trapping them. I prop pieces of bark or wood against the trunk of the tree, or against neighbouring fences, &c., about two or three feet above the ground. Then whenever I happen to be in the vicinity I look under them, and if the tree harbours *C. xerampelina* my trap probably contains a few. This method has the advantage of enabling a large area to be worked for these larvæ with little trouble, as the traps can be set and examined at any time during the day. Incidentally, I find a good many squeezed in crevices in the bark of the tree, and also in natural hiding places such as under loose bark on neighbouring fences. The larvæ travel considerable distances, as I have found them concealed as much as twenty feet from the trunk of the tree.—SAVIGNAC B. STEDMAN; Binbrook, Market Rasen, Lincoln, May 22nd, 1908.

PALIMPSESTIS (CYMATOPHORA) OCTOGESIMA IN LONDON.—Might I record in the 'Entomologist' the capture of *Palimpsestis* (*Cymatophora*) *octogesima* on two different occasions last July at arc-lamps at West Hampstead, by Mr. P. Layman? Has it been recorded so near London before?—E. MANNERING; Trinity Clergy House, 74, Bolsover Street, W., May 25th, 1908.

[See also Entom. xxxix. 257.—ED.]

NOTES FROM THE HASLEMERE DISTRICT FOR 1906 AND 1907.—Having now been in Haslemere for two seasons, I am beginning to find that, even with my limited leisure for collecting, it is a locality full of possibilities for the entomologist, and a short record of my experiences may be of some interest. I have at present discovered twenty-four species of Rhopalocera. Larvæ of *Zephyrus quercus* are very abundant, and any number of *Gonepteryx rhamni* can be bred from the alder-buckthorns, which are to be found plentifully; but the most interesting thing to me has been the breeding of an exceedingly varied series of *Chrysophanus phlæas*. Some were fed on dock, others on sorrel, but the proportion of specimens with blue spots on the lower wings was very great in each case. The variation in other respects was less marked. *Euchloë cardamines* is plentiful, and so is *Callophrys rubi*, and I have observed *Argiades sylvanus* ovipositing freely in a field where *Hesperia thauwas*, *Lycæna argus*, and many other insects are common. *Cyaniris argiolus* was seen in some numbers during the spring of 1907, and from a batch of larvæ which began to pupate on Sept. 17th a forward male emerged on Oct. 15th, though the rest of the brood have stood over. Among interesting captures by day may be mentioned *Chærocampa elpenor*, *Macroglossa stellatarum*, *Mitochrista miniata*, *Lithosia sororcula*, *Drepana binaria*, *Heliaca tenebrata*, *Erastria fasciana*, *Bomolocha fontis*, *Epione advenaria*, *Eurymene dolabraria*, *Asthena luteata*, *Bapta temerata*, *B. bimaculata*, *Numeria pulveraria*, *Bupalus piniaria*, *Lomaspilis marginata*, and *Melanthia albicillata*; *L. marginata* being very varied, and *E. advenaria* being in the greatest profusion.

Larvæ of *Hemaris fuciformis* and *Anarta myrtilli* have been discovered, and the following larvæ have been beaten: *Hylophila prasinana*; *H. bicolorana*, *Lophopteryx camolina*, *Amphipyra pyramidea*, *Hadena protea*, *Gonoptera libatrix*, and many others. Ova have been obtained of *Pæcilocampa populi*, *Arctia villica*, *Dicranura vinula*, *Euplexia lucipara*, *Euclidia glyphica*, *Epione advenaria*, *Eurymene dolabraria*, &c.; and a very remarkable variety of *E. advenaria* emerged on April 8th, 1907. It is very much smaller than usual, and is of a uniform dull brown colour, with no markings to speak of. A more or less spasmodic examination of the street-lamps has produced several good things, including *Pæcilocampa populi*, *Lophopteryx carmelita*, *Notodonta trepida*, *Polyploca flavicornis*, *P. ridens*, *Panolis piniperda*, *Erastria fasciana*, *Eurymene dolabraria*, *Selenia illustraria*, *Numeria pulveraria*, *Ligdia adustata*, *Lobophora carpinata*, *Anticlea nigrofasciaria*, *Cidaria suffumata*, and *C. silaceata*. The results from sugaring about thirty young fruit trees in my garden have been good, among other insects taken being *Thyatira batis*, *Dipterygia scabriuscula* (very abundant), *Apamea basilinea*, *Noctua triangulum*, *Xanthia fulvago*, *X. flavago*, *Aporophyla nigra*, *Agriopis aprilina*, *Euplexia lucipara*, *Hadena genistæ*, and *Xylina socia*.—F. A. OLDAKER, M.A.; The Red House, Haslemere, March 2nd, 1908.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 6th, 1908.*—Mr. C. O. Waterhouse, President, in the chair.—Mr. Thomas Godfrey Andros, Ph.D., F.Z.S., of Wilton House, 31, St. Saviour's Road, Jersey; Mr. Chourappa Chetti, Assistant Curator of the Government Museum at Bangalore, India; Mr. Frederick Charles Fraser, I.M.S., M.D., M.R.C.S., L.R.C.P., of Trichinopoly, India; Mr. Walter M. Giffard, of Keeaunoki Street, Honolulu, Hawaiian Islands; and Mr. Alfred Vander Hedges, of 42, Kensington Park Gardens, W., were elected Fellows of the Society.—Mr. A. H. Jones exhibited an example of the melanic ab. *nigra* of *Tephrosia consonaria* bred from a wild female taken near Maidstone, by Mr. W. Goodwin; and a living larva of *Sesia andreniformis* feeding in the stem of *Viburnum lantana*.—Mr. R. Shelford brought for exhibition a number of specimens of insects in amber. They showed several forms closely allied to those of existing insects: one orthopteron being very near to *Ectobia lapponica*.—The President, a living example of *Blatta* found among bananas from Mexico. Mr. Shelford said he thought the species to be *Pandora niveus*, Lin.—Mr. H. M. Edelsten, a living larva of *Nularia senex*, and living larva and pupa of *Calligenia miniata*. He drew special attention to the clubbed bristles on the former as being incurved and most curious.—Mr. O. E. Janson, a white aberration of *Epinephele jurtina*, taken in Holme Park, Sussex, in June, 1904.—Professor E. B. Poulton read a letter from Mr. S. A. Neave giving an account of the bulbul feeding its young with various "unpalatable" species. He also exhibited a collection of Asilids and their prey from the Tring Museum, and a series of *Neptis* from Madagascar to illustrate the specialization of this butterfly in its island form. A discussion on the developments of coloration in insular forms of this and other Lepidoptera followed, in which Dr. T. A. Chapman, Mr. G. A. K. Marshall, the Rev. G. Wheeler, Lt.-Col. N. Manders, and other Fellows participated.—Lieut.-Col. Manders, a collection of butterflies from Bourbon demonstrating examples of mimicry and the effects of the interaction of species. He concluded by describing the physical characteristics of the island, and said that the area favourable for the existence of *Euplœas* was extremely small, and as the larvæ of *goudoti* and *euphon* fed on the same plants there was in all probability a struggle for existence set up in which the invader proved the stronger and eventually exterminated its rival. In the discussion which followed Professor Poulton remarked that in the neighbouring island of Rodrigues there was a species of *Euplœa* (*desjardinsi*) greatly resembling *euphon*, and no doubt a geographical race of that species, and this would also suggest that *euphon* formerly existed in Bourbon.—Mr. H. St. J. Donisthorpe showed an example of the beetle *Xantholinus distans*, Kr., taken at Helton, near Dumfries, on May 1, a species new to the British list.—Mr. W. J. Lucas showed a glow-worm found at Oxshott on May 4, inside the shell of the snail *Helix cantiana*. There was no doubt that the larva was feeding on the snail, for on breaking away parts of the shell he found the moist remains of it near the apex. He also brought for exhibition the male, female, and nymph of the dragonfly *Oxygastra curtisii*, first de-

scribed by the late J. C. Dale, and read a paper on "The British Dragonflies of the 'Dale Collection.'"—Dr. T. A. Chapman, M.D., F.Z.S., read a paper on "The Distinction of Several Species of *Everes*, determined by their Genitalia," and exhibited photographs to illustrate his remarks. He announced that as the result of his investigations *Everes argiades*, Pall., and the so-called var. *coretas*, were separate, though very nearly allied species.—H. ROWLAND-BROWN, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY—April 9th, 1908.—Mr. Alfred Sich, F.E.S., President in the chair.—Mr. Kaye exhibited an Agaristid moth, *Scirocastnia præfecta*, from Peru, which by its antennæ and general superficial characters closely resembled an Erycinid.—Mr. R. Adkin, a drawer of the various forms of *Angerona prunaria*, and another of *Boarmia repandata*. A discussion arose as to labelling insects geographically. It was suggested that a label of locality might be placed at the side below each set of a species from one locality. This would be impossible in a collection where the idea was merely to group the varieties.—Mr. South exhibited several species of *Cucullia*, with a view to gain some definite idea as to what the species *C. scrophulariæ* really was. Considerable discussion took place, but no definite result was arrived at.—Mr. Sich exhibited a number of "house moths," some eleven species, including *Endrosis fenestrella*, *Borkhausenia pseudopretella*, *Tinea pellionella*, *T. pallescentella*, *T. fuscipunctella*, *Tineola bisellipella*, &c., and read a short paper on his exhibit. A discussion took place as to the ravages of these pests.

April 23rd, 1908.—The President in the chair.—Mr. R. Adkin exhibited a specimen of *Argynnis aglaia* with the left fore wing only about half-size, but otherwise perfect. It was taken at Eastbourne. He also showed a larva of *Tortrix pronubana* with a parasitic larva attached to its under surface.—Mr. Gadge, light forms of *Orgyia antiqua* and *Rumicia phlæas*.—Mr. Kaye, an asymmetrical form of *Anticlea badiata*.—Dr. Chapman, living larvæ of *Polyommatus icarus* and *Plebius argus* (*egon*), the former quite and the latter nearly full grown.—Mr. Newman, stems of *Viburnum* containing larvæ of *Sesia andreniformis*, larvæ of *Camptogramma fluviata* and *Agrotis ashworthii*, and imagines of *Cucullia scrophulariæ* and *C. verbasci*.—Mr. Moore, two Indian Pierids, *Catopsilia catulla* and *Delias eucharis*, with bleached wings.—Mr. R. Adkin, specimens of *C. scrophulariæ*, *C. verbasci*, &c., *C. lychnitis*, for comparison.—Mr. Step, photographs of *Helleborus fetidus*, and read notes on its fertilisation, &c.—Mr. Main, larva, pupa, and imago of the meal-worm *Tenebrio molitor*.—Mr. Sich, specimens of *Xanthia fulvago* (*cerago*) var. *flavescens* from Forres.—Mr. Rayward made some remarks on the life-history of *S. andreniformis*.—HY. J. TURNER, *Hon. Rep. Sec.*

HERTFORDSHIRE NATURAL HISTORY SOCIETY.—Mr. A. E. Gibbs, F.L.S., recorder of Lepidoptera, presented his annual report at a meeting held at the County Museum, St. Albans, on May 12th, and referred to the fact that very few insects which needed more than a passing mention were met with during the year. His local correspondents, who, he regretted to say, were a decreasing band, united in describing the season as a disappointing one. It was sunless, cold and damp—

conditions which were unfavourable to insect life. The only species which had been added to the county list of Lepidoptera was *Hyponodes costæstrigalis*, taken at Ashridge on July 24th and August 22nd by Mr. A. T. Goodson, of Tring. Mr. Gibbs referred to the comparative abundance in his garden of *Agrotis saucia*, an insect of which he had not previously taken more than one or two specimens in a season. He obtained ova and fed up fifty-one larvæ in a warm kitchen, forty-four moths emerging between March 4th and 11th of the present year. These in turn gave a few ova, which were successfully photographed by Mr. A. E. Tonge, F.E.S., of Reigate. Reports of work done and observations made during the season were received from Miss Alice Dickinson, New Green's Farm, St. Albans, Mr. P. J. Barraud, F.E.S., of Bushey Heath, Mr. A. H. Foster, of Hitchin, Mr. J. E. Perrott, of Watford, and Mr. A. T. Goodson, of Tring.—A. E. GIBBS, *Hon. Sec.*

RECENT LITERATURE.

A Guide to the Exhibited Series of Insects.

APART from the huge collection of insects housed in the basement of the Nation's Natural History Museum at South Kensington, there is, in one of the galleries on the main floor, a series of twenty-eight table cases arranged over the central area, three or four cabinets along the borders, and an assortment of cases on the walls. Two of the table cases contain material illustrative of Structure and Classification of Insects, and in the others are shown specimens belonging to the nine Orders of Insects, here arranged in the following sequence:—Aptera, Orthoptera, Neuroptera, Trichoptera, Lepidoptera, Hymenoptera, Diptera, Coleoptera, and Rhynchota. In two of the cabinets are perfect insects and caterpillars of British Lepidoptera, and British and Foreign insects are in the others.

Furnished with a copy of this excellent illustrated guide of some sixty pages, the visitor will find examination of the various objects invested with an interest which might be lacking without such a handy instructor.

A Natural History of the British Butterflies.

IN the last volume of the 'Entomologist,' p. 256, the first eleven parts of volume ii. of this elaborate work by Mr. J. W. Tutt were referred to. Parts xii.—xxi. of the same volume are now to hand. There are one hundred and fifty-three pages of text, of which thirty-two are introductory, twenty plates, and explanations thereof on separate pages. The subject-matter comprises *Ruralis* (*Zephyrus*) *betule*, pp. 296–320; Tribe Lampididi, Genus *Lampides*, Hübn., pp. 329–331; Tribe Celastrinidi, Genus *Celastrina*, Tutt, pp. 332–386; *C. argiolus*, L., pp. 387–416 (part). One of the plates gives photographic figures of the butterflies *L. batiscus* and *C. argiolus*, and the others show life-histories and structural details of larvæ and pupæ; all the latter are greatly enlarged. The parts, which are issued monthly, are published by Elliot Stock, Paternoster Row, E.C.

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LIFE-HISTORY OF *LYCÆNA ACIS*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

ON July 1st, 1907, I received from Prof. Rebel, at Vienna, four living females of *Lycæna acis*, who kindly sent them to me at the request of the Hon. N. Charles Rothschild. I am, therefore, indebted to both these gentlemen for their kind assistance in procuring me living examples of this extremely rare British species.

I at once placed all four females on growing plants of *Anthyllis vulneraria*. On July 5th I noticed a few eggs were deposited, and several more on the following day; in all from thirty to thirty-six ova were laid on the calyces of the flowers, mostly near the base, and often hidden between them.

The egg is very similar to that of *L. arion*, being of the same size—*e. g.* $\frac{1}{40}$ in. wide—but slightly higher ($\frac{1}{36}$ in.) and of similar structure; the micropyle, however, is much smaller, and but slightly sunken, resembling in this respect the egg of *L. argiades*. The whole surface is covered with a beautiful reticulated network pattern; the reticulations surrounding the micropyle are simple, but gradually develop at each juncture into raised knobs, which are prominent elsewhere over the surface. All the reticulations resemble white-frosted glass, reflecting the beautiful pale blue-green ground colour of the egg. Shortly before hatching it assumes a greyish tinge. The egg-state lasts ten days. The eggs laid on the 5th hatched on the 15th. The young larva makes its exit by eating a small hole in the side of the egg just large enough to allow of its escape.

Directly after emergence the larva is very small, being only $\frac{1}{30}$ in. long, but stout in proportion. It is almost exactly similar in all respects to *L. arion*, except that the hairs of *acis* are longer and the general colouring of the body is of a greener tinge. It has a shallow dorsal longitudinal furrow; on the first segment, which is the widest, there is a large dorsal disc and a smaller one on the anal segment; both are some-

what glazed and grey in colour. The body is a pale greenish blue-grey, with citrine-yellow shadows; along the dorsal surface are longitudinal rows of very long and also short glassy white, finely serrated hairs, placed in pairs on each segment bordering the furrow, the first one very long, the second short; both curve backwards, and have dark olive-brown pedestal bases; below are two very small hairs projecting laterally; the spiracles are large and dusky. On each segment are three subspiracular hairs, which are long and project laterally also; the central one is very long. Below on the lateral lobe are two other similar but shorter hairs, and others on the claspers; they all have dark bulbous bases. The head is shining brownish black. The entire surface is sprinkled with blackish points. The eggs and claspers are the same colour as the body.

On July 19th I carefully examined the flowers, and found the young larvæ had eaten through the base of the calyces, and were feeding on the green seed-pod within.

One of the butterflies lived until July 20th.

On July 23rd I again examined some of the flowers, and found two larvæ in the second stage; another undergoing the first moult, and others in the first stage feeding on the seed-pods.

Shortly before first moult it measures only $\frac{1}{16}$ in. long, and is pale ochreous yellow.

After first moult it is a good deal similar to the previous stage, but has additional hairs and three subdorsal spiracular-like discs on either side of each segment, and one sublateral; the surface is covered with greyish raised points. On the first segment is a dorsal shield-like disc, slightly sunken, and of a dull olive-colour, beset with little circular discs varying in size. The colour is pale ochreous, with faint longitudinal medio-dorsal and lateral lines and oblique side-stripes of a slightly darker ochreous.

Before second moult it is $\frac{1}{9}$ in. long. The colouring is paler and markings more indistinct. In some specimens the colour is almost uniformly of a pale ochreous yellow. They still feed on the seeds.

Before third moult it is $\frac{3}{16}$ in. long, the segmental divisions are deeply cut, the body is thickly studded with white serrated hairs, each with an ochreous-brown tubular base and black spiracular-like discs. On the tenth segment is a dorsal transverse gland, very similar to that of *L. arion*; at the edge are a few minute white hairs with branching tips. I noticed a tiny bead of liquid exuding from it. The dorsal disc on first segment is fan-shaped, with a glazed surface beset with minute discs, as in previous stage, but has in addition three hairs. The whole colouring of the body is pale ochreous yellow, with medio-dorsal, subdorsal, and subspiracular pale rust-red stripes, which are

broken up on each segment, being composed of a series of short bands, and those forming the subdorsal series are slightly oblique; the lateral stripe is continuous round the broad, rounded, and somewhat flattened anal extremity; the head is black and shining. Some specimens are paler than others, and some are distinctly yellow after feeding on the yellow petals of the flowers. They feed on all parts of the bloom. In general appearance and structure they are very like *L. arion* larvæ, but less pink in colour.

Besides the flowers of *Anthyllis vulneraria* the larvæ of *acis* feed readily on clover-blossoms both white and pink, but for choice prefer the pink, which they greedily devour, eating all parts of the blossom.

During the second week of August most of the larvæ entered into hybernation; some I found concealed within the calyces of the *Anthyllis*, and others under the leaf-like bracts and also between the calyces. Although several were kept in a warm temperature, with early morning sunshine, and during the warmest days of the summer, they all remained motionless.

During the first week in September I placed a few of the larvæ out of doors (these were hybernating on flower-heads of clover and *Anthyllis*); the pots containing the plants were only protected by gauze covers, so they were subjected to all conditions of weather throughout the autumn and winter—therefore, were practically kept in a natural state. On January 20th, 1908, I examined a pot kept out of doors, and found on a brown dead clover-bloom one larva apparently perfectly healthy, which had not moved since the middle of August; also, on a dead flower-head of *Anthyllis* there was another in a similar condition.

Again, on February 22nd, I carefully examined the plants kept both out of doors and in a cold conservatory, and found altogether nine larvæ, all apparently very healthy and hybernating. These had not moved at all since entering into hybernation; some were between the calyces of the dead *Anthyllis*, and very difficult to detect, while others were hidden within them; some on the leaf-bracts, and one on a dead *Anthyllis*-stem at the base of a withered leaf, and two on dead clover flower-heads between the petals. In all cases the larvæ were resting with their heads pointing inwards, towards the base of the flowers.

On March 20th three larvæ moved from their hybernaculums, the others remained motionless. Having no other likely food-plant for these larvæ, I placed them on three separate blossoms of furze (*Ulex europæus*), upon which they remained without feeding for a time. On the morning of March 24th I noticed one had been feeding on the inside cuticle of the calyx, and another I saw feeding on the petal of another blossom. This

day being warm with considerable sunshine, three more left their hybernaculums. I therefore gave them young shoots of clover, on which they fed, perforating the leaves, and also bored into the swollen shoots enveloping the young leaves, feeding on the interior in the same way as *L. argiolus* larvæ feed on young holly-berries. The following days they continued feeding at times.

On April 1st another left its hybernaculum.

Third moult: on April 8th the first one moulted the third time, followed by one moulting on the 9th, another on the 10th, and others fixed for moulting on the 11th.

Before third moult, two hundred and thirty-nine days old, it measures $\frac{1}{6}$ in. long when fixed for moulting. Of a very pale yellowish flesh-colour; all the markings dull pale pinkish, giving the larva a pale flesh-coloured appearance.

One of those which left its hybernaculum on March 20th was kept solely on furze-bloom, and moulted the third time on April 15th. They remain some days fixed for moulting.

After third moult, two hundred and forty-five days old, it measures $\frac{1}{5}$ in. long. The ground colour is now of a pale ochreous green, with the dorsal, subdorsal, and lateral stripes dull pinkish drab; otherwise it is very similar to the previous stage, excepting it is more densely studded with hairs of varying lengths; each with a darker green truncated swollen base encircled with a series of black points; there are also numerous spiracular-like discs; a gland on the tenth segment, and on the eleventh segment below and behind each spiracle is a retractile tubercle. They continued feeding on the tender shoots of clover, preferring the young expanding heads of the plant, and feed at all times during the day.

Fourth moult, April 26th. After this moult the larva is wholly of a clear green colour.

After fourth and shortly before moulting the fifth time it measures $\frac{3}{10}$ in. long. Similar to previous stage, excepting the hairs are longer, and the ground colouring is a clear light green, with darker green but somewhat indistinct markings.

On May 2nd two fixed for fifth moult; one moulted late afternoon of the 4th, the other early on the following morning; while on this day four others were fixed for the fourth moult, and one feeding in the same stage; also one larva still in the third stage, which remained in partial hibernation, as it shifted its position on May 3rd, but not then left the dead part of the plant which formed its hybernaculum. This one again moved on May 17th, when I placed it on a clover-blossom, upon which it rested for a week, and died on May 25th, having lived for about two hundred and eighty days without feeding.

The one that moulted on May 4th for the fifth and last time became fully grown and spun up for pupation on May 17th, and

pupated ten a.m. on the 19th, the last stage occupying fifteen days.

After fifth and last moult fully grown, about two hundred and seventy-five days old, it measures $\frac{7}{12}$ in. long. In shape and size it greatly resembles *L. arion* larva. The small shining black head is set on a moderately long retractile neck, which is frequently protruded beyond the first segment while it is crawling and feeding, which, when at rest, is completely withdrawn and hidden in the segment. Although the head is disproportionately small for the size of the larva, it is more than twice the size of the minute head of *L. arion* larva.

Dorsal view: The anterior and posterior segments are overlapping and rounded; the body narrowest anteriorly, widening to the eighth segment. The segmental divisions are deeply cut, each segment boldly convexed. Side view: First anterior and last three posterior segments flattened and projecting laterally; second to ninth segments are humped dorsally; a slight medio-dorsal furrow; the sides sloping and lateral ridge dilated, ventral surface bulbous and ample. The whole body is rather densely sprinkled with finely serrated spinous hairs; the longest are along the dorsal surface and lateral ridge, where they form a projecting fringe all round the larva, and the first two segments are also covered with longish hairs, and a few are scattered along the subdorsal region; all these longer hairs are pale brownish, becoming whitish towards the base, which is in the form of a pedestal, and of a greenish white colour; the other hairs are very minute, white, and glassy. On the first segment is a fan-shaped whitish dorsal disc, studded with shining black raised processes and tiny white hairs; scattered over the body are shining black spiracular-like discs, very small, common to the *Lycænidae* larvæ. On the tenth segment is a transverse gland, very like that on the same segment of *arion* larva, but in *acis* it is not fringed with the extremely minute branching hairs, but is instead surrounded by numerous little circular discs and tiny white simple hairs; and on each side of the eleventh segment is a retractile whitish tubercle; the claspers and ventral surface are glaucous; the legs whitish, ringed with dark olive.

The larva which entirely fed on furze-blossoms since hybernation pupated on May 22nd, and produced a fine male imago on June 7th. This larva remained a much paler colour, being a pale greenish yellow-ochreous, and the pupa was likewise pale in colour.

The larvæ spun themselves up on different parts of the plants, both on the stems, leaves, and flowers; in each case a very slight cocoon was formed by a few strands of silk, and also attached by the hind claspers to a pad of silk and a cincture round the middle.

The pupa averages in length $\frac{5}{12}$ in.

Dorsal view: The head is obtuse, from the base to middle of wing the outline is straight, then swelling to second and third abdominal segments; abdomen attenuated to the rounded anal segment. **Side view:** The head rounded, with slight swellings at base of antennæ; thorax convex; division between first and second segments forming an obtuse angle; abdomen slightly swollen and curving to rounded anal segment; ventral surface forms almost a straight line, in which respect it mainly differs from *L. arion* pupa. The cremastral hooks number in all twenty-four, and are placed in two distinct patches of twelve each.

The entire surface (like *arion*) is covered with very fine brown reticulations, and, excepting the wing, is sprinkled also with minute circular discs; these are especially numerous on the head and prothorax; also sprinkled over the surface are finely serrated whitish bristles. On each side of the prothorax is a small patch of bristles with their ends finely ciliated. The dorsal gland of the larva is modified into a slight suture, marked in the centre by a brown spot.

When first pupated it is a clear transparent green, showing the nervures of both the primaries and secondaries and the general internal structure; it gradually assumes an ochreous tinge at both ends, and the darker dorsal line (dorsal vessel) can be seen pulsating as in the larva.

When four days old it is mostly of a dull ochreous green; thorax whitish green; head and anal segment pale pinkish buff; neururation of both wings still showing.

When nine days old and normal the colour is a pale ochreous green; wings palest, inclining to whitish; head, prothorax, and anal extremity tinged with rust-red, caused by the density of the reticulations and discs; spiracles whitish; nervures still showing under the thin pupal skin.

On the twelfth day the maturing of the imago commences by the eyes becoming a pale reddish drab and the wings opaque cream-colour; the eyes daily deepen, and wings become paler and more opaque. On the fifteenth day the eyes are dark brown; wings, thorax, and head light tawny buff; abdomen greenish ochreous. On the following day the whole colouring is quickly transformed into black, blue, and grey. In the males the wings are then rich deep metallic-blue at the base, blending into light greenish blue, forming the median area; the rest of the wing black, and black nervures crossing the blue; outer border creamy white; the eyes, thorax, and dorsal half of abdomen steel-black; ventral surface olive. A few hours before emerging the blue of the wings assume a silvery grey, and all the hair-scales of the body show clearly through the thin delicate texture of the pupal skin, giving the whole a silvery-grey appearance.

The pupa is attached to the food-plant by the cremastral

hooks and a cineture round the waist, and a few strands of silk spun around it, forming a slight cocoon.

The first imago (a male) emerged on June 5th; it pupated on May 19th, making the pupal period seventeen days. Others emerged at intervals during the first half of June, in all five males and one female—all fine specimens.

Hitherto the life-history of *L. acis* has remained a blank to British entomologists, and by the meagre descriptions given by the various authors concerning the larva and pupa, obviously copied from Rühl, very little appears to be known to the Continental authors. Certainly Rühl's description is confusing and misleading, as he states the larva is full-fed in August, changes to a pupa in September, and passes the winter in that stage.

DRAGONFLIES IN 1907.

By W. J. LUCAS, B.A., F.E.S.

IN 1907 I seem to have met with little that was worthy of record in connection with the British Odonata. The season was not an early one, the first dragonfly observed being a male *Pyrrhosoma nymphula* at the Black Pond, Surrey, on May 5th. In my experience, however, there was no dearth of specimens of the various species as time went on, whatever may have been the case with insects of other orders.

At the beginning of September *Sympetrum striolatum* was very common in the New Forest, and no doubt it continued on the wing as usual till well towards the end of the year, but the last specimen noted by myself was on Bookham Common, Surrey, on September 22nd. *Sympetrum sanguineum* was present on Ockham Common, Surrey, on September 8th, and on the following day I captured the species at the Black Pond, where I had not previously met with it.

Mr. A. O. Rowden tells me that on July 21st he took *Orthetrum cærulescens* at Tavy Cleave on Dartmoor, and Mr. G. Nicholson gave me a female example of its congener, *O. cancellatum*, taken at Wroxham, in Norfolk, in August, which had caught a *Vanessa urticae*. On July 31st *Cordulegaster annulatus*, which was common in one of the rides in Dames Slough Enclosure in the New Forest, seemed in some cases to be pursuing the butterflies which were also numerous there. On August 2nd, also in the Forest, I saw an *Anax imperator* hovering over a boggy pool near Beaulieu River, and found a bodyless *Pieris napi* on the surface of the pool, which I concluded had been captured and mutilated by the dragonfly. The same day *Lestes sponsa*, a common species, but one I have not often met with in the New

Forest, was taken near Beaulieu River. *Ischnura elegans* was received from Bedford, having been captured on August 22nd.

As regards the two New Forest species, *Ischnura pumilio* and *Agrion mercuriale*, the former was met with on August 5th at a new spot, though not a great way from one of its known haunts, while the latter also was discovered on August 24th some mile or two from any spot at which it had previously been noted. A few years since, in a so much examined place as the New Forest, the former was quite unknown, and the latter almost so; now both are found to be common. It is therefore quite likely that here and elsewhere new dragonflies of the smaller species will reward the searcher, just as did *Agrion hastulatum* in Scotland and *Agrion armatum* in the Broads. These last did not receive attention during 1907, but Mr. J. J. F. X. King tells me that when last he visited the home of *A. hastulatum* on the River Spey he took only a few specimens after very hard work.

On October 27th, a very dull but moderately mild day, I caught a brightly marked female *Æschna cyanea* on the wing about mid-day on Esher Common, Surrey. Not only was this the last dragonfly noted for the season, but this date was the latest on which I have myself met with the species, though I have a record of one being found alive in Gloucestershire on November 12th.

ODONATA IN GERMANY.—II.

By E. R. SPEYER, F.E.S.

IN the first part of this paper (*ante*, p. 116), fifteen species of the larger dragonflies were recorded. In the present one there is an account of the smaller ones which were observed at Marburg-on-the-Lahn in the summer of 1907.

Calopteryx virgo, Linn.—This beautiful species was out in a very immature state on May 23rd, and was then difficult to distinguish from *C. splendens* at first sight. On June 27th mature males were not uncommon along the river towards Bürgeln, but females were absent. A male and female (the latter with a deformed abdomen) taken on August 3rd were the last observed specimens.

C. virgo must spend a great deal of its time far from water, but it is not nearly so plentiful as *C. splendens*.

C. splendens, Harris.—The dragonfly was plentiful everywhere except in the brickyard. The first specimen, an immature male, appeared on the bank of the river towards Giessen on May 25th, and from June 2nd till August 3rd the species was exceedingly plentiful; after the latter date it began to die off, and it was not observed after August 29th. There were actual

swarms of the species for miles along the river on June 27th, but I did not find any variety in size or colour, although I was on the look-out for abnormalities.

Lestes viridis, Lind.—The species is evidently found in localities where the surroundings are suitable, for I took it at the pond near the Southern Railway Station only, and even there it was uncommon. In August and September the male was sometimes more or less plentiful, but only four females made their appearance to me during the whole summer.

It was the habit of the male to fly rather rapidly and jerkily, and to settle on the highest reed-tops with half-expanded wings; the whitish pterostigma and anal appendages were then very conspicuous, but the insect was hard to see while flying, as its colour harmonized perfectly with the surroundings. I repeatedly watched males at the top of a poplar-tree; occasionally they would fly down into the reeds, where they could be netted.

The flight of the female is slower. Of oviposition I saw nothing, but possibly it is the same as in *L. sponsa*, for the two mature females which were taken were put up by beating the reeds. On August 3rd the species made its first appearance, and as it was still fairly plentiful on September 23rd, I conclude that it lasts into October.

L. dryas, Kirby.—The insect was found in the marsh, and there it was plentiful in September. A single female was taken at the pond near the Southern Railway Station on August 27th, but this must have been a stray specimen, as I did not take another there.

This dragonfly is distinguishable from *L. sponsa*, even on the wing, by its larger size and darker colour.

L. sponsa, Hans.—On July 7th this species was out, and was very plentiful in all the localities, except in the brickyard, until the end of September.

Sympycna fusca, Charp. — This most interesting species appeared first in a perfectly mature condition on June 9th at the pond adjoining the Lahn. On June 13th I again took mature specimens at the pond near the Southern Railway Station; on June 16th I took a single male only at the former locality.

Not until August 25th did the dragonfly appear again, and then it was very plentiful in both the localities mentioned, but in a very immature state. After this I did not observe it again. This surely points to the hybernation of the species, which dies off in June, the new generation emerging from the nymph in August, as De Selys points out in his 'Monographia' (1840, p. 146). When immature, the dragonfly no doubt spends its time far from water. I never observed the female ovipositing; perhaps oviposition takes place in October. The species flies close to the water, where it is difficult to see.

Platynemis pennipes, Pall.—Of the Zygopterides observed

this was one of the most plentiful. It was out on the banks of the Lahn towards Giessen on June 2nd in large numbers, and on September 2nd I still took specimens. In June and July it was plentiful in fields, and I took several specimens on bushes on the sides of the mountains on June 18th.

When immature I took var. *lactea* only, but later var. *bilineata* and the normal form were also abundant.

Erythromma najas, Hans.—On May 25th the dragonfly was out along the river. In June it was plentiful at all the localities with the exception of the brickyard and marsh; but in July it became scarce, and on July 8th I thought I had seen the last of it. But on August 3rd I took a single male at the pond near the Southern Railway Station.

On the under side of the bodies of males there were often large numbers of red *Acari*.

E. viridulum, Charp.—I found this minute dragonfly at the pond near the Southern Railway Station. On July 22nd it was not very plentiful, and all the specimens taken were very immature; in this state they were difficult to distinguish from *Ischnura pumilio*. The female was at this time the more plentiful. On August 3rd both sexes were very abundant, and they continued to be so till August 31st. On September 9th I took two specimens only, and on September 23rd again two; the latter were worn.

The habits of this species are rather similar to those of its larger congener, but it is less shy and does not fly over the water so much. The dragonfly does not go far from water when immature, but flies slowly about bushes close to its native pond.

On August 27th a male of this species was found in the jaws of the female *L. dryas* taken at the pond near the Southern Railway Station.

Pyrrhosoma nymphula, Sulz.—Although more or less well distributed, the dragonfly was never at all plentiful, and the time of flight was short, unless it was spent far from water. On June 9th I took the first specimen, and on June 13th it was not uncommon, but after June 27th I did not notice it again until August 3rd, when I took a single male. The brickyard and the marsh were the only two places where I did not find it. Perhaps the species is more abundant in favourable summers.

Ischnura pumilio, Charp.—On May 23rd a single immature male was taken in the brickyard. I did not record it again, and cannot account for its appearance.

I. elegans, Van der Linn.—Was as common as *P. pennipes*. As early as May 25th I took specimens in the brickyard, and it was abundant everywhere until August 31st, after which date I did not observe it. The female var. *rufescens* was plentiful, but the normal forms were more numerous.

Agrion pulchellum, Lind.—On May 25th several females

NAME OF SPECIES.	MAY	JUNE	JULY	AUG.	SEPT.	FIRST OBS.	LAST OBS.	REMARKS.
<i>Sympetrum striolatum</i> ...	—	—	—	×	×	Aug. 27	Sept. 9	
" <i>vulgatum</i>	—	—	—	×	×	Aug. 25	Sept. 23	
" <i>sanguineum</i> ..	—	—	×	—	×	July 8	Sept. 23	
" <i>flaveolum</i>	—	—	—	—	×	Sept. 2	Sept. 8	Probably out in August and lasts till October.
" <i>scoticum</i>	—	—	—	—	—	Sept. 2	Sept. 8	Probably out in August and lasts till October.
<i>Libellula depressa</i>	×	×	×	—	—	May 23	July 21	
" <i>quadrimaculata</i>	—	—	×	—	—	July 8	July 8	Only one specimen observed.
<i>Orthetrum cancellatum</i> ...	×	×	×	×	—	June 10	Aug. 27	
<i>Cordulia aenea</i>	—	—	×	×	—	May 12	Aug. 3	
<i>Somatochlora metallica</i> ...	—	—	—	×	—	Aug. 3	Aug. 3	Only one specimen observed.
<i>Gomphus vulgatissimus</i> ...	×	×	—	—	—	May 23	May 25	Probably lasts into June. Empty nymph-case on
<i>Lindenia forcipata</i>	—	—	×	?	×	June 27	Sept. 19	Seen on three occasions only.
<i>Æschna cyanea</i>	—	—	—	×	×	Aug. 26	Sept. 19	Probably lasts well into October.
" <i>grandis</i>	—	×	×	×	×	Aug. 3	Sept. 8	Probably lasts until beginning of October.
" <i>isosceles</i>	—	×	×	—	—	June 28	July 16	Only two specimens observed.
<i>Calopteryx virgo</i>	×	×	?	×	—	May 23	Aug. 3	
" <i>splendens</i>	×	×	×	×	—	May 25	Aug. 29	
<i>Lestes viridis</i>	—	—	—	×	×	Aug. 3	Sept. 23	Probably lasts longer.
" <i>dryas</i>	—	—	—	×	×	Aug. 27	Sept. 8	Probably lasts into October.
" <i>sponsa</i>	—	—	×	×	×	July 7	Sept. 23	
<i>Sympycna fusca</i>	×	×	×	×	—	June 9	Aug. 25	Two appearances.
<i>Erythronma nias</i>	—	—	×	×	—	May 25	Aug. 3	
" <i>viridulum</i> ...	—	—	×	×	×	July 22	Sept. 23	
<i>Pyrrososoma nymphula</i> ...	×	×	×	×	×	June 9	Aug. 3	July probably spent far from water.
<i>Platycnemis pennipes</i>	—	×	—	×	×	June 2	Sept. 2	
<i>Ischnura pumilio</i>	×	×	×	—	—	May 23	May 23	Only one specimen observed.
" <i>elegans</i>	×	×	×	—	—	May 25	Aug. 31	
<i>Agrion pulchellum</i>	×	×	×	×	—	May 25	July 19	
" <i>puella</i>	×	×	×	×	×	May 19	Sept. 8	
" <i>lindenii</i>	—	—	—	—	×	Sept. 19	Sept. 19	Only one specimen observed.
<i>Enallagma cyathigerum</i> .	—	×	×	—	—	June 9	Aug. 31	

were out along the banks of the Lahn towards Giessen. I did not observe the species again until June 10th, when I took males only at the pond adjoining the Lahn. After this it was sometimes plentiful in all the localities except in the brickyard. On July 19th the last specimens were observed.

The dragonfly was subject to great variation in size, and in some males the blue markings on the abdominal segments were considerably reduced.

A. puella, Linn.—The dragonfly was common everywhere during May, June, and July. In August it became scarce, but it lasted till September 8th, when I took the last specimen observed, a male.

A. lindenii, Selys.—This interesting species appeared once only. On September 19th, while walking along the edge of the pond near the Southern Railway Station, I drove a mature male out of the grass.

This dragonfly is at once distinguishable from other Agrionids by the anal appendages, which are semicircular, rather reminding one of the genus *Lestes*. The abdomen is also curiously thickened towards its extremity. A separate genus will no doubt be allotted to this dragonfly.

Enallagma cyathigerum, Charp.—This dragonfly was plentiful from June 9th till August 31st. I took one specimen of the blue variety of the female on July 19th.

Owing to the wet weather experienced during the summer, it is probable that several species did not appear. Representatives of the genera *Anax*, *Brachytron*, *Æschna*, *Libellula*, *Gomphus*, and *Orthetrum*, not observed, no doubt occur at Marburg, and Mr. Morton suggests *Cordulia flavomaculata* also.

FIELD NOTES ON BRITISH SAWFLIES.

BY CLAUDE MORLEY, F.E.S., &c.

THE Rev. F. D. Morice's invaluable "Help-Notes towards the Determination of British Tenthredinidæ," which have been appearing in the Ent. Mo. Mag. since 1903, and are still far from completion, have so stimulated hymenopterists in the study of our indigenous sawflies that an account of those with which I have personally met during the course of the last twelve or thirteen years may not be without some slight, though, I fear, more or less local, interest. Mr. Morice has not pretended to treat of the distribution, comparative frequency, habits, or economy of these insects, concerning which little or nothing has been published (as far as I am aware) since the completion of Cameron's Monograph in 1892. I will at once state that I have no especial knowledge of this group of insects, that my acquaint-

ance with it is confined to the field, and that it is to Mr. Morice's kindness and to that of Rev. E. N. Bloomfield and Miss Chawner that I owe the identification of all my specimens.

The Lydidæ are divided into three subfamilies—the Lydini, Cephini, and Xyelini (for which the suffices *-ides*, as in the Tenthredinidæ s. s., would be more uniform)—and all the species of the first division appear to be of uncommon occurrence. The late Mr. Alfred Beaumont has given me a single *Neurotoma flaviventris*, labelled “York, Hawkins, 1893,” and on June 3rd, 1898, I beat from white poplar in Bentley Woods, near Ipswich, the only two females of *Pamphilus sylvarum* I have ever seen, though the same spot was constantly worked from 1892 to late in 1904. Beaumont also gave me *P. balteatus* and *P. hortorum*, both of which he captured at Gosfield, in Essex, in June, 1902; and the late Mr. A. J. Chitty took *P. depressus* at Pamber Forest at the beginning of June, 1904. I have, in like manner, once in 1894 taken two *P. sylvaticus* in the Bentley Woods, but never seen it there again. The Cephini, as a whole, are much commoner, and I have them all. *Macrocephus linearis* has thrice occurred to me at Rockland and Surlingham Broads, in Norfolk, by sweeping the marsh herbage in very boggy places, and in a high dry pasture on an oxeye daisy to the east of Yarmouth, in the Isle of Wight, in June; my single *M. satyrus* was captured by Beaumont at Lyndhurst, in the New Forest, June 5th, 1897. Of *Cephus*, *C. pallidipes* is, perhaps, the rarest, or at least most local; in Suffolk it has only occurred to me from June 17th to July 5th, at Barnby Broad, Henstead, Tuddenham Fen, and Moulton, but in the middle of last June I found it in countless multitudes on the Red Cliff at Sandown, as well as at Yarmouth, Parkhurst; and, in the New Forest, at Matley Bog. *C. pygmaeus*, with its curious parasite *Collyria calcitrator*, Grav., is abundant about cornfields everywhere from the end of May to September 24th, though *C. pilosulus*, which is much mixed with it, is confined, in my experience, to June, and is much less common. *Janus cynosbati* was captured at Brandon, in Suffolk, by Chitty early in June, 1903, and Beaumont took *Calameuta filiformis* at Oxshott on May 23rd, 1897. The distinct *Trachelus tabidus* I have always found on the flowers of *Heracleum sphondylium* in June and July; it was especially common at Moulton in 1899, and has also turned up at Boxford, Claydon, and Bentley Woods, where I have thrice beaten the rare *Xyela julii* from the branches of *Pinus sylvestris* between April 9th and May 11th. Beaumont records it from Oxshott on May 3rd (Ent. Mo. Mag. 1897, p. 257).

Of our five species of Siricidæ—or should I say six? (cf. Ent. Record, 1908, p. 63)—*Xiphydria prolongata* has once occurred to me in plenty at Mildenhall, in Suffolk (cf. Ent. Mo. Mag. 1899, p. 190), and both *Sirex gigas* and *S. noctilio* (*juvencus*, Brit. Cat.)

are not uncommon, especially in 1898 (*cf.* Ent. Mo. Mag. 1898, p. 213). Both the latter species are now known to be indubitably indigenous, and both are preyed upon by the handsome ichneumon *Rhyssa persuasoria*, Linn., several females of which were flying round holes whence I cut both sexes of *S. gigas* in fir-poles at Horning Ferry, in the Norfolk Broads, in June, 1901. Several species of this family are, however, introduced. Leonard Jenyns took *Sirex duplex*, Shuck. (*cæruleus*, Fab.) commonly among spruce-firs at Fulbourne in June and July, 1837, and Mr. Robert Godfrey sent me on June 22nd, 1907, a live male of *Tremex columba*, Linn., three of which had just emerged from a several-year-used maple beam in Glengowan Print Works, which had constantly been in boiling starch at a temperature of 70° Fahr. I possess *S. noctilio* from Leamington and Westgate-on-Sea.

I have met with but a small percentage of the Cimbicidæ, and have given a detailed account of *Cimbex connata*, with a mention of the subterranean pupation of *C. femorata* (Ent. Mo. Mag. 1905, p. 214). I possess three species of the involved genus *Trichiosoma*, of which one—the common hawthorn species, *T. lucorum*, Linn., I believe it to be—has the abdomen quite dull throughout, with distinctly brown pilosity, and the other two somewhat metallic abdomens, with distinctly grey pilosity, with or without rufescent markings. Those with the upper margins and whole under side of the abdomen red are *T. silvatica* of Mr. Morice's table, and that without such markings is undoubtedly *T. latreillei*. Both of these seem rare; I have but a pair of the former from "larvæ on birch in Scotland" (Peachell) and "New Forest, 1892" (Gulliver), and only one of the latter, which I beat from white poplar in the Bentley Woods, June 10th, 1895. I have given a long account of the parasitism of *Spilocryptus cimbicis* on *T. "oxyacanthæ,"* with a figure of the latter's pupa ('British Ichneumons,' ii. 273), and pointed out that the colour of the tibiæ is purely sexual (*cf.* Ent. Mo. Mag. 1904, p. 127). I first bred them from their powdery larvæ at Epsom College in 1889. The glorious *Abia sericea* occurs in August at Tuddenham Fen, Barnby Broad, and Henstead Marsh, in Suffolk, and not rarely on flowers of *Angelica sylvestris* in Matley Bog, in the New Forest, where *A. fasciata* is then abundant; I have found the latter also at Bentley Woods, and first took it at Helpston Heath, near Peterborough, in August, 1889. *Arge* seems to be an uncommon genus; I have only met with *A. ustulata* in Suffolk and *A. cærulescens* in the New Forest in any quantity. Even *A. cyanocrocea* has occurred to me but twice—in 1894, and on *Cherophyllum* flower early in June, 1904; while a single *A. fuscipes* was beaten from birch bushes in Assington Thicks, in Suffolk, in the middle of May, 1902. *A. rosæ* was not met with till the end of August, 1905, when I found many larvæ feeding

on cultivated rose in the garden of Tuddenham Hall, which produced imagines from semi-transparent, pale yellow, ovate cocoons during the following spring. *Lophyrus* (probably) *pini* is said to have been found on pine at Easton, in Suffolk, but I have never seen it here. Miss Chawner has, however, kindly given me both sexes from the New Forest, and I have also received its flesh-coloured cocoon for identification from Ushaw Moor, near Durham (it was mistaken for that of a moth!).

Following Mr. Morice's nomenclature, the Nematides is the first subfamily of the restricted Tenthredinidæ, and many of its species are very abundant. *Cladius pectinicornis* is by no means uncommon here from the middle of May to the end of September, when Mr. W. H. Tuck has taken it plentifully about Bury St. Edmunds, but in the Isle of Wight, where it is even commoner, it is abroad quite by the beginning of May. Imagines of *Trichiocampus viminalis* have never occurred to me in the field, but their cocoons, composed of gnawed particles of wood and enclosing a transparent pale brown inner layer, are common beneath willow-bark during the winter; from three such, found on March 3rd (and still containing larvæ), on the under side of a piece of fallen bark at Tattingstone, in Suffolk, there emerged a pair between the 6th and 18th of the following June, and a female on July 14th. From a similar though much flatter cocoon (its shape is doubtless largely regulated by the "elbow-room" at its grub's disposal), composed by a "larva beaten from oak" on October 20th, 1894, there emerged a female of this species—which invariably feeds on willow—on 28th of the following June! *T. ulmi* has only occurred to me singly at Leiston, Tuddenham, Lowestoft, and Monks Soham; while a single *T. drewseni* was found in a greenhouse at Ryde, Isle of Wight, on August 11th, 1902. *Priophorus padi* is one of our commonest species, and may be swept from herbage everywhere from the end of May to that of September; I have it from Hants, Norfolk, and all parts of Suffolk; but *P. tristis* is much rarer, and I have only two specimens, both taken early in 1895 at Bramford, near Ipswich, and the Bentley Woods, by sweeping.

Both species of *Hemichroa* are handsome insects, and neither is common; *H. alni* has occurred to me on birch in the Bentley Woods on May 25th; in a marsh at Rookley, in the Isle of Wight, at the end of June; and on flowers of *Angelica sylvestris* among alders at Lackford Bridge, Suffolk, on August 26th. *H. crocea* is not more abundant at Brandon on June 9th, 1903, and by sweeping in a wood at Freston, near Ipswich, on July 22nd, 1904. At Matley Bog, in the New Forest, on June 13th, 1907, I took a single female *Leptocercus luridiventris*. *Dineura nigricans* is one of the commonest and prettiest sawflies of the Bentley Woods and Assington Thicks in May and June, when it is

frequently beaten from birch-bushes; but *D. stilata* is certainly rarer, since I have only swept it during the first half of June from hazel, &c., at Monks Soham, Brandon, and Wroxham Broad. Nor is the little *Micronematus monogyniæ* more plentiful in the Bentley Woods and Matley Bog from the middle of May to that of June; and only one *Cryptocampus*, which Mr. Morice thinks is *C. saliceti*, has occurred to me at Barton Mills, Bentley Woods, and Needham in Suffolk, and Calbourne in the Isle of Wight, in May and June. Both *Cræsus septentrionalis* and *C. varus* were not uncommon among alder at Matley Bog in August, 1901, and the former is found at Brandon during the same month. Stephens (Illus. vii. 39) records it somewhat doubtfully from Bungay, apparently on Curtis's authority, and Westwood exhibited a specimen "one of the hind legs of which, although perfect, was considerably smaller than the other. From the collection of Rev. W. Kirby, F.R.S." (Proc. Ent. Soc. 1840, p. v.). In August, 1898, I found a lot of larvæ near Lowestoft, which Mr. Bloomfield thought referable to this species; *C. latipes* appears to be rarer, and I have only one, found at Oxshott by Beamont, May 25th, 1901. *Pontania bipartita* is represented in my collection by a single pair, swept in the salt-marshes at Walberswick and Dunwich, on the Suffolk coast, at the end of May, 1905; but *P. leucosticta* is sometimes in the utmost profusion on willow trees both in Suffolk and the New Forest often as early as April 24th. *P. viminalis* is also very common, especially in marshes about Southwold, in June and July, and from an old willow-stump I had brought indoors here on 10th of last April a female had emerged, and was sitting on the bare wood at 11 a.m. on May 21st; *P. salicis* and *P. proxima* are common in similar situations in May and June, the latter extending to the first week in August.

The British Nemati, as now restricted, consist of but four, or perhaps five, species, concerning whose appearance there seems to be something peculiar, since I have taken both sexes of *N. abdominalis* upon but one occasion in the Norfolk Broads; two *N. acuminatus* on only May 29th, 1902, in the oft-worked Bentley Woods by beating birch; and three *N. luteus* together on June 7th, 1903, on oft-beaten alders at Brandon. *Pteronus* is a long genus of twenty-three species, of which I find only fourteen represented; the first, *P. salicis*, is very common on osiers, and I watched a female laying her eggs in a leaf of this tree on June 18th, 1903—three or four are inserted in very oblique rows on either side of the midrib in the apical half only. *P. ribesii* has very uncommonly turned up, though of course abundant in every garden. There is a capital account of it in one of the old Entomological Magazines. In 1893 I took a single *Nematus consobrinus*, Cam. (female), which Morice doubtfully synonymises with *P. leucotrochus*, Htg., and in May and June,

1895, a single pair of *P. pavidus* was beaten from birch in the Bentley Woods. *P. myosotidis* is very common in May and August; it has turned up at Lavenham, Oulton Broad, Barnby Broad, and Ipswich in Suffolk, and about Lyndhurst in Hants; but *P. hortensis* appears to be rare—at all events, I have only one female, which was beaten from low bushes in Bentley Woods in the middle of June, 1896. *P. virescens* occurs in the same locality, as well as at Barton Mills and Tuddenham Fen, sometimes as early as April 26th, the latest date of capture being August 28th; it is probably common. At Henstead in August, Bentley in May, and at Merston in Isle of Wight in June, I have found a species referred with comparative certainty to *P. melanaspis*; and *P. curtispinis* has turned up at Tuddenham Fen in June, Bentley Woods on birch in early May, and on very late *Heracleum* flowers on the cliffs at Southwold on September 4th, 1907. *P. oligospilus* is probably common, though I have only met with three females at Brandon, Tuddenham, and on the banks of the Orwell at Ipswich, by beating sallow-bushes, and along with it at the first town is found *P. polyspilus*, not infrequently in the middle of August. Only one *P. brevipalvis* has fallen to my lot; she was beaten from an alder at Foxhall, near Ipswich, on September 10th, 1904, and *P. bergmanni* has not been seen there since 1894. The handsome *P. miliaris*, Panz., was taken at Ipswich during the same season, and a second specimen bred from a somewhat irregularly shaped, dull, smooth, jet-black cocoon found by Mr. G. W. Clutton at Burnley; when I received it on August 23rd, 1899, the imago had entirely removed its operculum, but would not emerge, though quite perfect, without assistance.

(To be continued.)

THE ATHALIA GROUP OF THE GENUS MELITÆA.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 142.)

WE come now to the smallest and one of the most interesting of the group, probably the most ancestral of the whole genus—older, I think, than *varia*, older even than *merope*—the high-mountain species, *asteria*. This was first named by Freyer in 1828, the year in which his first volume was published. He illustrates it quite unmistakably, and writes one of his little square pages about it, but does not give anything that lends itself to quotation by way of a description. He says it is only half the size of *dyctinna* (*sic*)—a name he attributes to Ochsen-

heimer—or of *athalia*, or of “*corythalia*”; that it approaches nearer to the first on the upper side and to the second on the under side, and gives as the best distinctive mark the absence of the inner edging line of the border, of course—though he does not say so—on the under side. There has never been any doubt as to the identity of this species, and the under side always serves for the determination of specimens, though the inner edging line is occasionally indicated, and the upper side is sometimes astonishingly close to *merope*. It has also escaped synonyms, except that Herrich-Schäffer spells the name *asterie*. With regard to its ancestral position more must be said later.

Britomartis, which is usually, and I have no doubt wrongly, given as a variety of *aurelia*, was in point of fact described and separated from *athalia* before what is now regarded as its type-form. It was first named and described in the first number of the Breslau ‘*Zeitschrift für Entomologie*,’ p. 2 (1847), by Assmann, the first editor of the magazine. His description runs as follows:—“*Melitæa alis integris,* ferrugineis nigro-reticulatis; posticis subtus flavidis, fasciis tribus cinnamoneis, maculisque duabus subalbicantibus, linea nigra ante marginem anteriorem flavum vel cinnamoneum.*” He then proceeds to give a more detailed description, in which he says that the ground colour is generally rather darker than *athalia* on the upper side, and that the nervures and bands are more or less suffused, in particular the basal half of the hind wing shows only the one light spot of the ground colour. The same darker ground colour obtains on the under side of the fore wing, but there is often a second row of lighter spots (*i. e.* nearer the base than the lunules) as in *dictynna*. The black spots are also larger. The most distinctive marks are, he says, afforded by the under side hind wing, as in the other species. The lighter bands (which he treats as the ground colour) are light yellow, the darker vary from a very

* Assmann very properly objected to the expression “*alis dentatis*,” used in previous descriptions of *Melitæas*; even Borkhausen’s “*subdentatis*” was only a partial correction. Principally from this point of view he gives the following amended definitions of the related species (*aurelia* not having at that time been described):—

“*M. parthenic.* *Melitæa alis integris subferrugineis fusco reticulatis; posticis subtus flavidis; fasciis tribus cinnamoneis unaque albidula; linea nigra ante marginem anteriorem ferrugineum.*

“*M. dictynna.* *Melitæa alis integris saturate ferrugineis nigro reticulatis; posticis subtus flavis; fasciis tribus badiis, tertia nigropunctata; linea nigra ante marginem anteriorem badium.*

“*M. athalia.* *Melitæa alis integris ferrugineis nigro reticulatis; posticis subtus flavidis; margine anteriore concolore post lineam nigram; fasciis tribus fulvis.*

“*M. asteria.* *Melitæa alis integris sordide ferrugineis, fusco reticulatis; posticis subtus flavidis; fasciis duabus cinnamoneis; absque linea nigra ante marginem anteriorem flavidum.*”

This last is the first regular description of *asteria*, though it is merely a condensation of Freyer’s more diffuse account of the species.

dark yellow to a cinnamon or even chestnut-brown. The outer one is lighter in the part towards the costa, and in the lower part has the black spots which we are accustomed to associate with *dictynna*, or at any rate traces of them. In the outer band of this wing the border is always darker than the lunules; the lowest spot of each of the other two light bands, which are often joined together by a narrow yellow line, he describes as being lighter than the others, and with a certain glassy appearance. This, however, he afterwards found not to be characteristic or constant (Breslau, 'Zeitschrift,' No. 15, p. 39, 1850). He treats the triangular spot at the anal angle as belonging to the outer dark band instead of the lunular light one, and remarks on its being light, instead of calling attention to the fact, mentioned incidentally, that the apex is often filled in with brown. He describes the size as being between *athalia* and *parthenie*. Its locality was Klarenkranst Wood, about three miles east of Breslau; as he speaks of taking it on a "flowery common," he apparently uses "Wald" rather to mean a forest or wooded district than what we mean by a "wood." The latter half of June was the time of capture, the males appearing first; in a fortnight's time only females could be found. A more helpful indication of time is given in his statement that it appears about eight days before *athalia*. He adds that it does not seem to care for settling on the moist spots of the road like the latter.

I have considered it necessary to enter thus fully into Assmann's description, as this species seems to be so absolutely unknown and confused with all sorts of other species and varieties. The only other authentic descriptions are by Rühl—one in the 'Societas Entomologica,' fifth year, No. 14, p. 106, and the other in his 'Palæarctic Butterflies.' The former is the more important and interesting. In it he regrets the inadequacy of the material from which he had to make his description, but such as it was it was invaluable. There was in Frey's collection a specimen purporting to be *britomartis*, which, however, the owner would not allow him to examine; but in Zeller's was one, placed unreservedly at his disposal, which was sent to Zeller by Assmann himself, and from this, and two in his own possession which he compared with it, his description was drawn up. Now of course the important question to-day is, What did Assmann mean to describe? and therefore, Where can any of his specimens be seen? Both Zeller's and Frey's collections passed into the hands of the British Museum authorities, and therefore are naturally to be looked for in the Natural History Museum at South Kensington; but alas! they have long ago been broken up, and their contents scattered about amongst the remnants of other collections equally disintegrated, in order to make one general collection.

I am assured that it would have been impossible to keep these great historic collections separate and entire, and while my whole entomological soul cries out against their absorption into this Nirvana, where all their individuality is lost, I realize that it is too late for any remedy to be possible. Even granting the necessity for their disruption, and gratefully admitting that the original labels are never removed, one might still have hoped that no specimen would be omitted from the general collection which might possibly have any special historic interest or value, and that to those, whether excluded or included, whose correct place was doubtful (as in the case, for example, of unusual aberrations), an extra label might have been attached, stating under what species the previous owner had placed it. Whilst regretting that neither of these hopes is justified by facts, I must emphatically repudiate any suggestion that I am casting any reflection whatever on the present Curator of the Rhopalocera, whose kindness to me during my long hours of work at the Museum has been unfailing, and who, I know, regrets these omissions, for which he is no way responsible, as much as I do. Frey's specimen, which is not *britomartis* at all according to Assmann's description, was in the general collection, but Zeller's I could not find. Mr. Heron, however, kindly produced the drawers of excluded specimens, and there I instantly found it, so that this, in all probability the only co-type of the species to be found in England (or, for aught I know, elsewhere), is now restored to a place in the general collection, with the outlines of its history attached to it, as well as Zeller's own label, and its date and locality (Klarenkrans) pencilled probably by Assmann himself. The specimen is unfortunately a female, and therefore, as is usual in this group, less definitely marked than the average male would be; still, it serves as a standard of comparison, and cannot, in my opinion, be included, in the face of Assmann's and Rühl's descriptions, either under the head of *aurelia* or of *dictynna*.

In the latter part of July, 1904, I was hunting at Reazzino, between Bellinzona and Locarno, for *Heteropterus morpheus*, in consequence of Mr. Fison's re-discovery of that insect in this locality the previous year (after a lapse of nearly fifty years since it had been recorded in Switzerland), when on the 25th of the month I came across a *Melitæa* flying in some numbers in the marshy ground just beyond the quarries, which differed from any others with which I had a personal acquaintance. Most of the specimens were very small, ranging from the size of the *aurelia* of the Rhone Valley to that of *asteria*; the under sides resembled *dictynna*, but were more heavily marked on the fore wing; the upper sides varied greatly, some approaching *aurelia*, others *athalia*, whilst two specimens, a male and a female, were not more heavily marked than *parthenie*. At the

same time I took one specimen of *dictynna*, rather lighter than the average, and slightly smaller in size, but considerably larger than the largest of my other captures; moreover, this specimen was quite worn out, whereas the others were very fresh. The under side precluded the possibility of any other species than *dictynna* or *britomartis*; the upper side appeared to me to put the former out of the question. July, 1906, found me again at the same spot, and again this *Melitæa* appeared, a few males on the 14th, both sexes commonly on the 23rd, not only on its former ground but also on both sides of the main road. On comparing my specimens with the Silesian examples labelled *britomartis* in the Berne Museum, they appeared to be identical. At the end of June, 1907—a very late season—I again visited the spot, and found the remains of an earlier brood; a few males and a fair number of females were, however, in very passable condition. These were much larger than the specimens taken in the two former years, and mostly approached closely to *athalia* on the upper side, the under side again being close to *dictynna*, and presenting the black spots in the outer dark band which we usually regard as characteristic of the latter species. Unfortunately all the females which I kept with a view to eggs failed to oblige, and in fact proved to have laid all their eggs already; whilst others of the later brood which I had kept the previous year refused to lay in captivity, probably because I had not hit upon their proper food-plant, though I provided them with scabious and plantain, on the latter of which *aurelia* lays freely. Eggs which I obtained by dissection after the death of these second-brood specimens were unfortunately so shrivelled by the time they arrived in England that even Mr. Tonge was unable to produce very intelligible photographs of them.

Judging from the imago, I feel sure that the Reazzino specimens are, as I originally supposed, *britomartis*, the only alternatives being that they are a form of *dictynna* or a new species. The upper sides and certain other peculiarities appear to me to preclude the former, and there is as yet no reason to imagine the latter. They are certainly much closer to Assmann's specimen than to any other species. One very general, though not absolutely constant, peculiarity is the somewhat conspicuous angulation of the fore wing about a third of the way down the outer margin; this is very conspicuous in Assmann's example. Another objection to the *dictynna* theory is the fact that the Reazzino *Melitæa* is undoubtedly double-brooded. This is not the case with *dictynna* even much further south. It may of course be urged that Assmann only mentions one brood of *britomartis*, but this is north instead of south of the Alps, and he never suggests that he had even looked for a second brood; his mention of its appearance being earlier than that of *athalia* points at any rate to the possibility of a second brood, and his

date is scarcely later than that of the first brood at Reazzino. It may also be urged that Rühl speaks of *dictynna* as being double-brooded at Salzburg, but from what we know of this species elsewhere it is far more probable that the Salzburg insect is *britomartis* than that there is really a second brood of *dictynna* at so northern a point. Furthermore, even the lightest form of *dictynna* from the eastern Pyrenees (var. *vernetensis*, Oberthür) is still unmistakably *dictynna*, and would hardly be liable to be taken for *britomartis*. In subsequent observations on the distinctive marks of this species I shall on these grounds include the Reazzino specimens under this head.

(To be continued.)

NOTES AND OBSERVATIONS.

THE LONG LIFE OF SCOLIOPTERYX LIBATRIX.—In answer to the Rev. F. E. Lowe, a specimen of *S. libatrix* came to sugar on June 10th, 1908, near Peterborough. The colouring was rather dull, though it was otherwise in good condition.—C. L. HEBERDEN; 72, Adam's Avenue, Northampton, June 12th, 1908.

Your correspondent, Rev. F. E. Lowe, would probably be interested to hear that there were about a dozen specimens of this insect on my sugar-patches on June 1st of this year. One or two of them seemed in excellent condition.—J. S. CARTER; Radley College, Abingdon, June 16th, 1908.

With reference to the query this month regarding *Scoliopteryx libatrix*, it may interest your correspondent to know that I saw some half-dozen specimens of this insect at sugar on June 2nd this year near Hailsham, in Sussex. Beyond the natural fading of colours they were not by any means in bad condition. I see Barrett says, "After hibernation till May."—P. A. CARDEW (Capt. R.A.); St. Aldwyn's, Park Avenue, Dover, June 18th, 1908.

GYNANDROUS SPECIMEN OF BUPALUS PINIARIA.—While collecting at Oxshott yesterday afternoon, I had the good fortune to secure a gynandrous specimen of *B. piniaria* in very good condition. The left side is female, and the right male. The right hind wing is somewhat crumpled, and the left very slightly rubbed; otherwise, except that three legs are missing, it is practically perfect.—HAROLD B. WILLIAMS; 82, Filey Avenue, Stoke Newington, N., June 7th, 1908.

TERATOLOGICAL SPECIMEN OF MELITÆA AURINIA (ARTEMIS).—On June 5th, from Kent pupæ, I bred a specimen of *M. aurinia* with three wings, the right hind wing being absent. The specimen, an average-sized male, is otherwise quite perfect.—BERT. S. STONELL; 25, Studley Road, London, S.W.

ON REARING MELITÆA AURINIA (ARTEMIS).—During the past five years I have received from correspondents in Dover, Ireland, and Devon large numbers of the larvæ of this insect. Each year they

have taken readily to the honeysuckle I substituted for their natural food-plant; practically all turned to fine healthy pupæ, and then died. In answer to my inquiries of the senders as to their success with the larvæ, some find them easy to rear, and others experience difficulties in getting them through. Mr. Stockwell, of Dover, says he has never got many through, but a friend of his does well with them by spraying the pupæ daily. Previous to this year I have kept the larvæ in a cage with wooden top and bottom and gauze sides, and as they spin up on the ceiling of the cage, of course no sun could get at them. This season I put them in an all-gauze cage with a wooden floor, and kept them in a sunny conservatory, and each morning sprayed them with water. Not having a fine sprayer, I adopted the rough and ready method practised by seconds in the boxing-ring when their principals want refreshing, *i. e.* I took a mouthful of water and blew it through my compressed lips over them. For the encouragement of beginners in this art, I may add that a little practice enables one to produce a very fine spray, so fine that the larvæ show no sign of being disturbed. The first larva changed to pupa on May 18th, and the first butterfly emerged on June 1st. The record up to date (June 9th) is as follows. Out of about ninety-eight larvæ three died, and from the ninety-five pupæ I obtained ninety-two perfect insects, and two cripples. A few pupæ got detached and fell on the floor of the cage, but with no bad result, the imagines crawling up the sides and then expanding.—BERT. S. STONELL.

CAPTURES AND FIELD REPORTS.

ACHERONTIA ATROPOS AT OXFORD IN MAY.—I thought you might be interested to know that a specimen of *A. atropos* was taken on May 21st last at Headington Workhouse, near Oxford, by the master's wife. I heard of this yesterday afternoon, and cycled up and procured the moth, which I regret to say was rather damaged, as it had been pinned through the wings and put in a very small box. I should be interested to hear of any other report of the capture of this insect this year.—SYDNEY H. GALPIN; "Glenfield," Foxcombe Hill, near Oxford, May 29th, 1908.

PUPE OF LYCÆNA ARION.—Mr. Percy Richards has been good enough to send me a pupa of *L. arion*. This is one of four that he found on June 16th at Bude by searching in ant's nests under stones. "The pupæ," he writes, "appear to be carefully ensconced in earthen cells, which are possibly made by the ants, but which are of the exact size of the pupa." Three were found under one stone, and the fourth under another stone, and was the result of three hours spent in the somewhat tedious business of stone turning.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

COLIAS EDUSA NEAR GRAVESEND.—On June 13th, as my son and I were setting out on an entomological expedition, we saw a specimen of *Colias edusa* in a lane near the town. Unfortunately we both had

folding-nets, and though my son pursued the insect, fitting up his net as he did so, just as he was prepared to strike at it, it flew over the hedge and across a field of wheat, where of course he was unable to follow it. We were thus unable to judge of its condition. No doubt the prevalence of strong south-westerly winds lately has blown some *C. edusa* over from abroad, and if conditions continue favourable we may look for this species later.—H. HUGGINS; 13, Clarence Place, Gravesend.

PREVALENCE OF *ARCTIA CAIA* LARVÆ THIS YEAR.—Last season Mr. L. W. Newman remarked on the scarcity of these larvæ in Kent, and I was able to confirm his remarks as far as this district is concerned. Mr. Newman suggested that the scarcity last season was probably caused by the fact that the hot autumn of 1906 had carried the larvæ past their usual stadium, and the majority had died during the winter in consequence. I do not think that this theory is correct, for last autumn was quite as hot as that of 1906, and this season *A. caia* larvæ have been quite as plentiful as they ever were about here.—H. HUGGINS.

NOTE ON *METOPSILUS* (*CHÆROCAMPA*) *PORCELLUS*.—From the 17th till the 21st of June, *Chærocampa porcellus* has been hovering over and feeding from delphiniums in the garden here, and of them I took three specimens. As I have not heard before of *porcellus* visiting these flowers, I thought the capture worth recording.—D. C. HOLMES; The Briars, Manor Road, Thames Ditton, June 26th, 1908.

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1907–8. With Five Plates. Pp. i–xvi, 1–114. The Society's Rooms, Hibernia Chambers, London Bridge.

FROM the "Report of the Council," which by the way is the Thirty-sixth, we learn that the present membership of this flourishing Society totals 166. That excellent work is being done by the members, in the various departments of natural history study and research, the literary contents of the publication present convincing evidence. Among the papers are—"Our Authorities: an Introduction to the Early Literature of Entomology," by Hy. J. Turner, F.E.S.; "Rhopalocera of the Taunus Hills," by Alfred Sich, F.E.S.; "Notes on *Porthesia chrysorrhæa*" and "Further Notes on *Tortrix pronubana*," by R. Adkin, F.E.S. In the President's Address there is considerable reference to local Natural History Societies, their objects, &c.; also interesting remarks on the advantages of associating local societies in the form of a federation or union.

Three of the plates illustrate the life-history of *Tortrix pronubana*, largely reproductions of photographs by Mr. A. E. Tonge; two others show photos of the larvæ and pupæ of *Charaxes jasius*, by Mr. H. Main.



W. J. Lucas ad. nat. phot. 1

West, Newman proc. 2

- 1. LEUCOPHÆA SURINAMENSIS, Linn. from Kew Gardens (nat. size).
- 2. DECTICUS VERRUCIVORUS, Linn., ♂ (nat. size).

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[No. 543

DESCRIPTION OF A NEW FORM OF *ZYGÆNA* FROM ALGERIA.

BY THE HON. WALTER ROTHSCHILD, Ph.D.

Zygæna lavandulæ nisseni, subspec. nov.

I HAVE much pleasure in naming this new form after the genial Danish Consul in Algiers, Dr. Nissen, who first suggested our visit to Hammam R'Irha.

Differs from *Z. lavandulæ lavandulæ* at first sight by the much broader and rounder fore wing, and by the total absence of any red on the upper side of the hind wing. The metallic gloss of the fore wing above in the male has much less blue, and in the female appears more silky. *Z. l. nisseni* also differs strongly from *Z. l. lavandulæ* in the spots on the upper side of the fore wing. The two basal spots are much larger, the discal spot nearest the costa is as large or larger, while the lower discal spot is reduced to a black dot with a tiny red centre in most specimens, but entirely black in some. The apical spot is enlarged to quite double the size of that in the nymotypical form, and is concave on its inner side. On the under side the fore wings have the base largely red, but the lower discal spot is entirely absent; the hind wings in most cases have a basal red streak along the costa, and a minute red dot towards the apex, though in one male the red is absent below as well as above.

Hab. Hammam R'Irha, North Algeria.

This fine new form was discovered by Dr. Karl Jordan on May 26th of this year, numerous specimens sitting on thistle-blooms along the edge of a wood.

ORTHOPTERA IN 1907.

BY W. J. LUCAS, B.A., F.E.S.

(PLATE VI.)

LOOKED at from the point of view of the student of the British Orthoptera, 1907 presented few features of special importance, though matters of minor interest were not altogether absent. The weather, at any rate in the South of England, seemed not to affect adversely this order of insects in the same way as it did the Lepidoptera.

FORFICULOIDEA.—*Labia minor*, though considered a common insect, does not, in my own experience, make itself at all conspicuous. I met with but one, a female, seen on the wing in Surbiton Station on July 14th, and caught on an umbrella. While it was moving the pale joints at the tip of the antennæ were very noticeable, though perhaps the black background of the umbrella made them more conspicuous than they would otherwise have been. Mr. E. J. B. Sopp tells me he found it flying over manure on Rusthall Common, Tunbridge Wells, on April 1st, and that he met with it at Broadstairs (June) and Eastbourne (September). On August 1st I sought for and found *Labidura riparia* near Christchurch, in Hants. Males and females were present, though but two of the former were taken. Of several immature specimens found one was very small. The developing wings, when examined with a lens, are interesting objects of observation in the nymphs. From Mr. Burr I received in the autumn *Forficula lesnei* from Folkestone, and also, which is much more interesting, *Apterygida media (albipennis)*, taken September 24th, a few miles from Dover. This, following the late Mr. Chitty's rediscovery of the species in another part of Kent, is most satisfactory.

BLATTODEA.—On August 24th an *Ectobia lapponica* was captured in the New Forest on vegetation close to the ground, and on August 8th *Ectobia panzeri* was taken on a pathway in the New Forest. This latter species seems to be well distributed over the southern parts of the Forest at least, although perhaps it is usually a coast insect with us. Mr. E. C. Bedwell gave me two specimens of *Ectobia livida* taken at Boxhill, Surrey, on August 11th (and one from Mickleham Downs, taken on August 19th of the previous year). Mr. E. J. B. Sopp reports *Phyllodromia germanica* from Dover, Ramsgate, and Hastings, and Mr. W. Daws tells me of his having found *Blatta orientalis* in a garden on March 29th (*vide* Entom. xl. 110). On May 22nd, in the so-called insect-house at the Zoological Gardens, *Periplaneta americana* was quite at home in a wild state, and apparently its presence there was well-known to the sparrows, for while we

were watching a sparrow carried a specimen away from before us. Possibly the same thing had occurred before, as several wings and other remains were noticed near, the feast having apparently taken place on the spot when the house was free of visitors. Mr. W. Daws reports a male *Periplaneta australasie* from Mansfield on February 14th, and in the afternoon of September 14th a mature specimen was taken alive in one of the lily-houses in Kew Gardens, where, however, this species has for years been established under shelter. Another species which bids fair to become equally well established in the houses there is the neat little Surinam cockroach (*Leucophaea surinamensis*). Writing on April 20th Mr. G. Nicholson says it "is, or was, abundant in the tropical houses. It is extremely active, and disappears with a diving-like motion under the fibre. So far we have not noticed that it does any harm, and it is not trapped like *B. orientalis*, *P. americana*, or *P. australasie*. Hand-catching seems to be the only way of dealing with it." Some casual visitors belonging to this group of the Orthoptera have, as usual, put in an appearance. Mr. W. Daws obtained a male *Nyctibora holosericea* on February 28th at Mansfield (*vide* Entom. xl. 88). Mr. W. F. Kirby received *Stylopyga decorata*, Br. (*Dorylea rhombifolia*, Stoll.), which was found alive in the Western Tower, Natural History Museum, on November 16th, damaged through falling into lime. Mr. E. J. B. Sopp reports *Panchlora nivea*, L. (*virescens*, Thunb.), from Warrington in November. No doubt this list of "casuals" might be largely increased if captures were systematically reported.

ACRIDIODEA.—*Mecostethus grossus* was captured in several bogs in the New Forest, but the species seemed to be rather late in appearing, for I did not meet with it till August 17th. Mr. Sopp took *Stenobothrus elegans* at Willingdon (Sussex) and at Aldershot (Hants), and *Gomphocerus maculatus* at Frensham and Farnham in Surrey, and at Eastbourne in Sussex. In Kew Gardens Mr. G. Nicholson secured *Stenobothrus bicolor* and *S. parallelus* on September 18th. *Gomphocerus rufus*, one of our less common grasshoppers, was found in one of its known localities, Bookham Common (Surrey), on September 22nd. The most interesting point, however, in connection with this division of the Orthoptera was the capture by Mr. B. Piffard, of Brockenhurst, of a *Tettix subulatus* in the New Forest about the end of September. This specimen, which he was kind enough to give to me, is the first of which I have had personal acquaintance, with the exception of some taken by myself on the Hampshire coast a year or two since.

LOCUSTODEA. — Of *Leptophyes punctatissima*, a very pretty wingless grasshopper whose colours fade very rapidly, I took a male in Brockenhurst on August 31st, and Mr. Sopp reports it from Farnham (Surrey) in the first week of September. *Olyn-*

thoscelis cinereus seemed to be particularly common and of large size in the New Forest at the end of the summer, and Mr. Sopp took it at Farnham (Surrey) and at Aldershot. By the discovery this season of the wart-biter (*Decticus verrucivorus*) a few miles from Dover, Mr. Burr has been able to place this handsome species in a much more secure position on our list. The wart-biter is one of the largest and most powerful of our Orthoptera; but authentic British records are few in number.

GRYLLODEA.—At last the little wood cricket (*Nemobius sylvestris*) has come to light outside the boundaries of the New Forest. Mr. F. Morey, of Newport (Isle of Wight), tells me that it has been found by himself in Parkhurst Forest, and by Mr. H. F. Poole in Bordwood, also in the island. It should be added, however, that Rev. F. C. R. Jourdain once told me that it had been taken at Willington, in Derbyshire, by Mr. G. Pullen.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE HEMIPTERA—No. 9.

By G. W. KIRKALDY.

In my earlier papers in the 'Entomologist' I invariably employed the term "Rhynchota" as the scientific appellation of my favourite order. As I have in later years substituted for this "Hemiptera," and as I fell into error in No. 2 of these notes, and as a number of entomologists still use "Rhynchota," it will, I think, be well to see what is the correct term to employ, and why.

The Hemiptera were one of the original orders (1758) of Linnaeus, and embraced eight genera, viz.: *Cicada*, *Notonecta*, *Nepa*, *Cimex*, *Aphis*, *Chermes*, *Coccus*, and *Thrips*; thus, except for *Thrips*, a form of doubtful affinity, corresponding exactly to modern conceptions of Hemiptera.*

In 1775 Fabricius altered all the ordinal names of Linnaeus, Hemiptera becoming Ryngota. The genera were increased to seventeen, but except that *Pulex* appears now in this order, the latter is coterminous with the Linnean order.

In 1783 Retzius, professing to make a summary of De Geer's "Mémoires," split the order into three, as follows:—

Class 5. Siphonata (*Thrips*, *Aphis*, *Chermes*, and *Cicada*).

Class 6. Dermaptera (*Cimex* and *Nepa*).

Class 10. Proboscidea (*Coccus*).

In 1802 Latreille founded Homoptera and Heteroptera.

In advocating the retention of "Hemiptera," it is not

* *Pediculus*, placed by Linnaeus in "Aptera," is referred by some modern authors to Hemiptera, but this does not affect the argument.

altogether on the grounds of "priority." In orders and suborders, it is almost, if not quite impossible, to achieve this, but if it must be enforced, then, unless it be used to supersede "Physapoda," "Siphonata" must be used for "Homoptera." It must be noted, however, that Siphonata and Proboscidea are equivalent together to Homoptera. I think that when two names, such as Hemiptera and Ryngota (now usually spelt Rhynchota) are practically coterminous, the earlier should have the preference.

The synonymy I propose is therefore:—

Order HEMIPTERA, 1758 (type *Cimex*) = *Ryngota*, Fabricius, 1775.

Suborder 1. HETEROPTERA, Latreille, 1802 (type *Cimex*) = *Dermaptera*, Retzius, 1783 = *Hemiptera*, Westwood, 1838.

Suborder 2. HOMOPTERA, Latreille, 1802 (type *Cicada*) = *Siphonata* and *Proboscidea*, Retzius, 1783 (type *Aphis* and *Coccus*, respectively).

Hemipterists have almost always cited the date of publication of Fieber's 'Europäischen Hemiptera' as 1861, for the whole of the volume, though Hagen, indeed, mentions three hefts as follows:—Heft i., pp. 16 and 108 (1860); heft ii., pp. 109 to 304 (1861); heft iii., pp. 305 to 444 (1861).

Unless there were two different editions, which is hardly likely, Hagen has made a mistake. When visiting my friend Mr. J. R. de la Torre Bueno, in New York, in 1903, my attention was drawn to a copy of this work in the original covers, the first one I had seen. Mr. Bueno has now refreshed my memory, and I find that the proper dates are:—Heft i., pp. 1 and 112, and two Plates (1860). The "16 pp." are part of the "108" (or rather 112). Hefts ii. and iii. (in one), pp. 113 to 304 (1861); heft iv., pp. 305 to 444, and iii. to vi. (the "Vorrede") (1861). No further details are to hand, but it is probable that heft i. was published early in 1860, as the "Vorrede" is dated October, 1859. One hundred and seventy-eight Fieberian genera and thirty-two species are thus to be dated 1860, instead of 1861, as regards this book.

FIELD NOTES ON BRITISH SAWFLIES.

BY CLAUDE MORLEY, F.E.S., &c.

(Continued from p. 177.)

THE species of *Amauronematus* do not appear so common, and I have only found *A. fallax* at Ipswich and Tuddenham Fen on birch in May; *A. viduatus* at Wicken, Tuddenham, and Brandon in June and July, by sweeping low plants; and *A. vitatus*, which I believe Dr. Cassal has also found at Ballaugh, in

the Isle of Man, once on *Salix repens*, in the middle of May, in Tuddenham Fen. Nearly all our thirteen Pachynemati are common, but especially so is *P. trisignatus*, Fst. (*caprea*, Cam.), which turns up everywhere from April 18th to August 27th in Norfolk, Essex, Suffolk, Cambridgeshire, Hants, and Kent on sallow, though the similar *P. turgidus* has only occurred to me once, in a very marshy alder-carr near Southwold, at the beginning of June, 1905. *P. clitellatus* is probably much mixed with the preceding; I have found it only in the wettest parts of Tuddenham Fen and Barnby Broad in early May and mid-August, whereas *P. xanthocarpus* has alone appeared in Bentley Woods in the end of June, 1903, and a somewhat doubtful *P. apicalis* on birch in the same locality at the end of May, 1902. *P. albipennis* is abroad in August; I took a female at the beginning of the month at Ipswich in 1895, and a male at the end at Metton, near Cromer, in 1903. *P. vagus* is common in April, May, and June throughout Suffolk, but I have only twice found *P. obductus* in Tuddenham Fen in May and August on *Salix repens*; *P. rumicis* did not appear to me till 1905, but I have taken it each subsequent year in June at Dunwich, Reydon, and Monks Soham, in Suffolk, and in Norton Wood, in Isle of Wight. If one except *P. fulvipes* and *P. crassicornis*, the species of *Pristiphora* are by no means common, at least in the eastern counties; the former, however, is abundant in boggy places in Norfolk, Suffolk, and the Isle of Wight from the middle of June to the end of August, and the latter, which is hardly less prevalent, has occurred to me in Burwell Fen in Cambridgeshire, at Felixstowe, Brandon, Tuddenham, Bentley, and Sudbury in Suffolk, as well as at Ryde and Rookley in Isle of Wight. *P. pallidiventris* is almost confined with us to Tuddenham Fen, where both sexes are not infrequent throughout the summer on the dwarf sallow; and in August, 1901, I took a couple of *P. betulæ* on flowers of *Angelica* at Matley Bog and Bank, in the New Forest, but of the rest I possess but single specimens. A male *P. ruficornis* was swept from reeds early in May, 1901, at Bramford, near Ipswich; a somewhat doubtful female *P. subbifida* was captured at Aldeburgh by Mr. Tuck early in the following September; I secured a female *P. pallidipes* in the marshes near Southwold on June 4th, 1905, and a male *P. westoni*, Bridg., which I do not find synonymised by Morice, in Tuddenham Fen on June 19th, 1901; and, lastly, *P. quercus* is instanced by a male from Southampton, given me by the Rev. H. S. Gorham. *Lygæonematus*, the last genus of the Nematides, is very poorly represented in Suffolk (and I have taken none elsewhere) by one male *L. compressicornis* on alder in Barnby Broad, on August 11th, 1898, and a single female *L. laricis* in Bentley Woods on May 19th, 1903.

The second subfamily, the Hoplocampides, consists of eighteen species, among which *Phyllotoma vagans* was swept from herbage

at Brandon at the end of August, 1905, where also, as well as at Winterton in Norfolk, I have swept *Eriocampoides annulipes* in June. *E. variipes*, Klug, is not uncommon in June and July at Walberswick, and in the Bentley Woods. The two interesting species, *E. æthiops* and *E. limacina*, are not at all common with us; the former was, however, not rare on May 31st, 1900, examining the leaves of *Rosa canina* in the Bawdsey Marshes, near Felixstowe, and I noticed several on those of cultivated roses in the garden of our lodgings in Wicken early in June, 1902. Of the latter, I have given some account in the first volume of 'The Countryside' from a number of cherry-tree leaves sent me, from which this "slugworm" had quite devoured the epidermis; it rarely turns up in the Suffolk Bentley Woods and the Kent Blean Woods, though essentially a garden insect. *Hoplocampa pectoralis* and *H. rutilicornis* must, I think, be rare, since I have found but one of each, the former in a very marshy place among osiers at Barton Mills on June 12th, 1889, and the latter (female) on some bushes in Dodnash Woods, near Ipswich, on April 27th, 1897. But both *H. crategi* and *H. ferruginea* are abundant in hedges throughout the spring, and in June, 1899, I bred one of the former, referred by Mr. Morice to the doubtfully distinct form *H. alpina*, Thoms., which I am strongly of the opinion (though my notes fail me) emerged from a gall of *Cynips kollari*, where it had perhaps hybernated.

Several of the Blennocampides are among our commonest sawflies, and all have a particularly *svelte* appearance, claiming particular attention in the net. *Mesoneura opaca* (*Dineura verna*, olim) appears pretty regularly in the Bentley Woods about May 20th, but I have not seen *Phymatoceros aterrima* there since 1894; and both sexes of *Pareophora nigripes* are rare at the same time of year at Foxhall and Lavenham, in Suffolk. All my *Periclista melanocephala* were taken at Bentley or Assington in woods in May, except one pair, which the late Mr. J. W. Cross sent me during the same month from Brockenhurst, in the New Forest, where, in Matley Bog, I found *Ardis sulcata* not rarely in the middle of last June. *Tomostethus fuliginosus* is common throughout Suffolk and in the Isle of Wight from the end of May to that of August, usually by sweeping low herbage, and both *T. dubius* and *T. luteiventris* are among the commonest British species, being constantly swept from low herbage in damp situations; the former I have from Norfolk, Suffolk, and Cambridgeshire, while its black-thoraced variety *nigrans*, Knw., was very abundant in Matley Bog, among alders, last June, and with it occurred the latter species in the greatest profusion, as, indeed, it also does in Suffolk, Norfolk, and the Isle of Wight. Of the genus *Blennocampa*, as now restricted to six species, none can be called really common, though *B. pusilla* and *B. alternipes* are perhaps most frequently met with, the former in May and

June in Assington Thicks and the Isle of Wight, as well as at Bungay, where Mr. Tuck has captured it; the latter extends to August, and has occurred to me on the banks of the Gipping above Ipswich in two or three places, and in the New Forest. *B. tenuicornis* I have only found at the beginning of June at Barton Mills, and twice at Foxhall, in the marshes by sweeping reeds, &c.; and *B. assimilis* is found in both East and West Suffolk quite by the beginning of May by general sweeping. I have all but three of the remaining species of this subfamily, which is strange, since most of them are but singly represented, and they must all be uncommon. *Scolioneura nana* occurs in the Bentley Woods in May and June, where it is accompanied in the former month by *S. betuleti*; but *S. vicina* has only once been found at Dodnash Woods, and then on September 16th. The single *Entodecta pumila* I have seen is a female swept in Rookley Wilderness, in the Isle of Wight, on June 27th, 1907, but *Monophadnus albipes* is not uncommon from April to June in Norfolk and Suffolk; where *M. geniculatus* has sparingly turned up in the Bentley Woods, and at Brockenhurst and Wilverley, in the New Forest, in May and June. My only *Kaliosphinga ulmi* was swept at the end of last May in a lane at Foxhall, and I have but twice met with *K. melanopoda*, once in Barnby Broad (cf. Ent. Mo. Mag. 1899, p. 209), and once at Diss, in Norfolk, in June. My single *Fenusa pygmæa* was taken during my "Day in Kirby's Country," June 10th, 1897 (cf. Ent. Mo. Mag. 1897, p. 265), and my only *F. nigricans* swept in a very boggy spot, among osiers, at Barton Mills, on June 12th, 1899. Of *Fenella nigrita* I also have but one example, which was taken by quite casual sweeping along the roadside where I have frequently swept before, and since at Belstead, in Suffolk, on May 29th, 1902.

The next subfamily is the Selandriades.

(To be continued.)

ON SOME BORNEAN SPECIES OF *TRIGONA* (APIDÆ).

By P. CAMERON.

THE species of *Trigona* I have in my collection from Sarawak, Borneo, may be separated by means of the following table:—

- | | | | |
|---|------|--|------------------------|
| 1 | (6). | Entirely black species. | |
| 2 | (3). | Base of wings blackish, the apex with
white | <i>collina</i> , Sm. |
| 3 | (2). | Wings hyaline. | |
| 4 | (5). | Apex of clypeus, mandibles, antennal
scape, and tarsi black | <i>canifrons</i> , Sm. |

- 5 (4). Apex of clypeus, mandibles, antennal
scape testaceous, apical joints of tarsi
rufous *erythrostoma*, Cam.
- 6 (1). Body not all black.
- 7 (17). Head black.
- 8 (14). Thorax black.
- 9 (12). Abdomen dark rufous.
- 10 (11). Thorax densely covered with fulvous
pubescence; base of cubitus straight,
oblique *fulvopilosella*, Cam.
- 11 (10). Thorax covered sparsely with short
black pubescence; the base of cubi-
tus roundly curved *erythrogaster*, Cam.
- 12 (13). Abdomen black in the middle, the base
and apex pale yellow; the femora
testaceous *latibalteata*, Cam.
- 13 (12). Abdomen pallid yellow, with pale fus-
cous bands; legs black *fusco-balteata*, Cam.
- 14 (8). Thorax testaceous.
- 15 (16). Apex of wings lacteous, legs for the
greater part black; the thorax densely
covered with fulvous pubescence . . . *lacteifasciata*, Cam.
- 16 (15). Wings clear hyaline, legs testaceous,
thorax with pale pubescence . . . *testaceinerva*, Cam.
- 17 (7). Head testaceous.
- 18 (19). Large; hind tibiæ and tarsi black;
wings yellow in front; stigma yellow *flavistigma*, Cam.
- 19 (18). Small; legs pale yellow; stigma pale *pallidistigma*, Cam.

Trigona erythrostoma, sp. nov.

Black; the apex of clypeus, the apex of mandibles broadly, and the apical four joints of the tarsi rufous; wings hyaline, slightly suffused with fuscous, the nervures and stigma black; the sides of front, apex of mesonotum, scutellum, mesopleuræ, mesosternum, metapleuræ, and the metanotum covered with white pubescence; the rest of the head, thorax, and abdomen with longer, stiffer black pubescence; the pubescence on the coxæ and trochanters white, on the femora and tibiæ black, on the tarsi white mixed with black; the four front trochanters and the basal joint of the anterior tarsi are rufous; the fore spurs of a paler rufous colour. Tegulæ black. ♂ or ♀. Length, 4 mm.

Kuching, Borneo (John Hewitt).

Smooth and shining. Basal abscissa of cubitus very little bent or angled; beyond the recurrent nervure (which is also very faint) it is almost obliterated. The scutellum rises obliquely from the base to the apex; the apical slope is oblique, projecting at the top over the lower part. The hind tibiæ become gradually dilated from the base to the apex. The under side of the antennal flagellum is brownish. The stump of the cubitus issues from the middle of the cubital abscissa.

Allied to *T. canifrons*, Sm., which is a larger species, and has the oral region, mandibles, and tarsi black.

Trigona fulvopilosella, sp. nov.

Black; the extreme base of antennal scape, the coxæ, trochanters, the greater part of the four anterior femora, the base of the posterior, tegulæ, and the abdomen, brownish red; the apical abdominal segments more or less black; the thorax densely covered with fulvous pubescence; wings hyaline, distinctly tinged with fulvous, the nervures and stigma pale fulvous, the posterior nervures paler than the anterior. ♀. Length, 7 mm.

Kuching, May and October (John Hewitt).

The centre of the mesonotum and metanotum are bare of pubescence, probably, however, through the hair having been rubbed off. The hair on the legs is black and stiff. The head has a white sericeous pile. The stump of the transverse cubital nervure is placed shortly below the middle of the first abscissa of the cubitus; the recurrent nervure is reaping-hook-shaped, *i. e.* the anterior half is roundly curved towards the apex of the wing, the posterior part being straight and oblique. The base of the hind tibiæ is distinctly narrowed, the latter not becoming gradually widened from the base towards the apex; the apical joint of the tarsi and the claws are rufo-testaceous.

This species comes nearest to *T. erythrogaster*, Cam.; the latter may be known from it by the thorax not being covered with fulvous pubescence, by the hind tibiæ becoming gradually narrowed from the base to the apex, the base not being distinctly narrowed, by the stump of the recurrent nervure being received above the middle of the basal abscissa of the cubitus, and by the recurrent nervure not being hook-shaped but straight.

Trigona fusco-balteata, sp. nov.

Black, smooth, shining; the antennal scape, apex of clypeus, labrum, mandibles, except at base, and more or less of the coxæ and trochanters, rufo-testaceous; the under side of flagellum of a darker rufous colour; abdomen pallid testaceous, the base of the segments broadly banded with fuscous; wings hyaline, the nervures and stigma dark testaceous; the basal abscissa of cubitus straight, oblique, unbroken. The head anteriorly from the lower half of the front densely covered with depressed white pubescence; the thorax with longer white pubescence, which is longer and denser on the pleuræ and sternum, especially on the latter; the sides and apex of the scutellum are fringed above with long pale hair. ♂. Length, 3 mm.

Medang, Sarawak (Hewitt).

The knees and apex of tibiæ may be testaceous, as may be also the base of the legs. The pubescence on the mesonotum is thicker round the edges, and it may appear as longitudinal stripes down the centre. The fuscous bands on the back of the abdomen are more distinct—darker—in some specimens than in others.

Trigona testaceinerva, sp. nov.

Rufo-testaceous; the head black, except the clypeus, labrum, centre of face broadly, and a triangular mark (the narrowed end above) between and above the antennæ; the base of mesonotum suffused with fuscous; wings clear hyaline, the stigma and nervures testaceous; the basal abscissa of cubitus straight, oblique, broken by the stump of the recurrent nervure shortly below the middle; the cubitus obliterated beyond the recurrent nervure. Antennal scape rufo-testaceous; the under side of the flagellum of a darker rufo-testaceous colour. The pubescence on the mesonotum and top of scutellum fuscous, on the rest of the thorax it is denser and white; the hair on the legs white. ♀. Length, 4 mm.

Kuching, Borneo (John Hewitt). A broad, ovate species.

Trigona pallidistigma, sp. nov.

Testaceous; the head above the antennæ and the occiput fuscous, the face and clypeus paler, the front more rufous in tint; the legs pallid yellow; the scape of antennæ rufo-testaceous, the flagellum black; wings hyaline, iridescent, the stigma and nervures pale testaceous. ♀. Length, 3 mm.

Sarawak, Borneo (R. Shelford).

Smooth and shining; the hair on the head, body, and legs short and white. The hind tibiæ become gradually widened from the base to the apex, which is roundly curved; the top closely fringed with white hair. Hinder metatarsus wide, becoming gradually but not very much wider towards the apex, which is rounded.

Is allied to *T. fusco-balteata*, Cam., which may be known by the black head and legs, and by the fuscous bands on the abdomen.

THE ATHALIA GROUP OF THE GENUS MELITÆA.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 182.)

*Aurelia** was first definitely separated from *athalia*, and the name given, by Nickerl in his 'Synopsis der Lepidopteren-fauna Böhmens,' published in 1850. He does not, however, give any concise description of it, but contents himself with mentioning

* My argument that we apply the name *athalia* correctly is in no way influenced by Mr. Rowland-Brown's criticism that *aurelia* is found at Fontainebleau and Lardy, since Geoffroy distinctly asserts in his preface that he confines his remarks to insects taken within a walk of two or three leagues of Paris, and in this sense of the word neighbourhood *aurelia* is, as I contended, absent from the neighbourhood of Paris. I may here also remark in passing that the paragraph on *dictynna* should obviously have preceded that on *parthenie*.

its points of difference from *athalia* as follows:—" *Aurelia** ist um $\frac{1}{3}$ in Ausmass kleiner als *athalia*, die Flugelform ist länger gestreckt, und in der Färbung herrscht ein dunkleres Braun vor. Die Unterseite ähnelt mehr der von *dictynna*, obgleich der Silberschimmer der Flecken an den Unterflügeln mangelt." (This last peculiarity, by the way, is very far from being constant in *dictynna*.) Nickerl also insists very rightly on the fact that the two species do not fly at the same time as a reason for their being distinct, and though his actual statements as to the times of appearance show that he was under a misapprehension, still the fact itself is conclusive. He speaks of *aurelia* as flying in the second half of June, when the "first brood" of *athalia* was worn out, and says that it did not occur again in his neighbourhood at the end of July and in August when *athalia* (obviously implying a second brood) was again very common. Now in point of fact *athalia* is never regularly double-brooded, though in very hot seasons a very partial and very stunted second brood does occasionally occur. On referring back to Nickerl's account of *athalia*, it is seen that he speaks of it as being very common from May to August, and as he ignores *parthenie* altogether, except for mentioning incidentally that it is not identical with his *aurelia*, I think there can be little doubt that under the name *athalia* he included not only the one brood of that species, but the two regular broods of *parthenie* which precede and follow it. This would correspond to the order of appearance in the Rhone Valley, where the first brood of *parthenie* is followed shortly by *aurelia*, then by *athalia*, which again is succeeded by the second brood of *parthenie*. In the mountains, for instance at Bérisal, at about 5000 ft., *aurelia* flies at the end of June and the beginning of July, but *athalia* again succeeds it; I have also taken one specimen above Zinal at an altitude of about 6500 ft. as late as mid-August, but I have never found *athalia* at so high an elevation, though if it occurred it would there probably be contemporary with *aurelia*. It is quite certain, moreover, that Nickerl was a little "shaky" on this group, for he refers his species both to Borkhausen's *parthenie*, which he afterwards says is *not* the same, and to Hubner's *athalia*, tab. 4, figs. 19, 20, which certainly represents *aurelia*, as well as to Esper's *athalia minor*, tab. 89, which, so far as it can be said to represent anything definite, approaches nearest to *varia*, though the letterpress would seem to point to *parthenie*.† North of the Alps this species seems to be single-brooded even in the plains, except in the

* *Aurelia* is a third smaller in size than *athalia*, the shape of the wings is longer, and in colour they are of a darker brown. The under side shows more resemblance to *dictynna*, though the silvery shine of the spots on the hind wing is wanting.

† Borkhausen, in 1788, when he first mentions *parthenie*, a year before he published his Latin description of it, distinctly states that he is speaking of the insect here depicted by Esper.

neighbourhood of Coire, but further south it must be regularly double-brooded, as it occurs in late July at Roveredo, and in August near Locarno. Except as above cited, *aurelia* appears to have no synonyms. Herbst's *parthenie*, 'Atlas,' pl. 283, figs. 1-4, referred here by Staudinger, appears to represent this species on the upper side, and *varia* on the under; while the text in vol. x. p. 238 (1800) seems to refer to the second brood of *parthenie*.

Varia, hitherto regarded as a mountain form of *parthenie*, but which I shall treat, at present at any rate, as a separate species, owes its name to Bischoff (to whom it was correctly assigned by the succeeding generation of entomologists), though it is first found in print, but referred to its real author, in Meyer-Dur's 'Schmetterlinge,' in 1851. He describes it as differing from *parthenie* only in its small size, but his illustration flatly contradicts his description. The male is by no means identical with *parthenie*, and the female does not resemble any form of that insect whatever. They are in fact good illustrations of the mountain species known to us as *varia* to-day. Although this was the first appearance of the name, the insect had been excellently illustrated by Herrich-Schäffer in 1843 as a variety of *athalia* on pl. 57, figs. 270-274, though both females are considerably less suffused than is usual, as much so, however, as specimens I have seen from Campfer in the Engadine. The following may serve as a concise description: "Melitæa parva, summas Alpes habitans, alis fulvis nigro fasciatis, plerumque apud fœminam nigro viridi-tincto obfuscatis; subtus, anticis parte exteriori paullum, parte interiori multum, præcipue apud marem, nigro signatis, posticis fasciis duabus fulvis et tribus flavis vel albicantibus, centrali et basali sæpe albis." This species (or variety) is without synonyms.

Lastly, it seems necessary to deal separately with *berisalensis*, as it was treated in Favre's 'Macro-lépidoptères du Valais' as a distinct species, especially as its history has been complicated by its unfortunate name, and by the consequent passing off by dealers (and others) of Bérisal specimens of *athalia*, which in no way resemble it, as veritable specimens of this insect. Special facilities which have come in my way for making myself acquainted with the ins and outs of this history, as well as a long and somewhat intimate knowledge of the insect itself in its Rhone Valley haunts, seem to me to make it the more necessary to deal with the matter in some detail. The insect was first described by Rühl in the 'Societas Entomologica,' v. p. 149, under the name *berisalii*, as a variety of *athalia* (!). His description reads as follows: "Alis anterioribus porrectis, alarum posticarum margine late diffuso, fere toto nigro, maculis lunatis in linea circum currente vix apertis; alis anticis subtus multis maculis nigris magnisque; alis posticis subtus margine lunato

fortiter nigre cincto." He further draws attention, in a short German comment on this description, to the depth of the ground colour, the elongated wings, the characteristic broad border of the hind wing nearly filling up the lunules, the strongly-marked fore wing on the under side, and the brightness and broad black border of the hind wing on the under side. After all this it is not surprising that he should add that the specimens he had examined were quite different from any other *Athalias* he had ever seen. These specimens were five in number, sent to him by their captor M. de Büren, of Berne, and purported to come from Bérissal. In my 'Butterflies of Switzerland,' &c., p. 87 (1903), I made the following observation: "The name *berissalensis* is a complete misnomer, it being an open secret that the original type-specimens came from Martigny, whence their captor went direct to Bérissal, his captures from the two places becoming mixed." This information was supplied to me by my friend the late Chanoine Favre, of Martigny; and though I was perfectly satisfied of the truth of this statement, I did not at that time feel at liberty to explain the matter more fully; later I had the pleasure of making the acquaintance of M. de Büren himself, the captor, as we have seen, of the type-specimens described by Rühl, who himself definitely assured me that my observation was correct, and that his specimens had actually been taken, as I had stated, at Martigny. Is it too much to hope that this definite declaration on M. de Büren's own authority will once for all clear up the confusion which the unfortunate name has caused? I further observed that: "It has never been taken at Bérissal, and it may be safely predicted that it never will be." I ought perhaps to have given my reason for such an assertion, which is that neither of the food-plants grows at anything like such an elevation; it would probably be quite impossible to find a single plant, either of *Linaria officinalis* or *L. minor*, within 2000 ft. at any rate, of Bérissal; the only *Linaria* that grows in that neighbourhood, and that principally at a considerably greater elevation, is the beautiful "dragon's-tongue," *L. alpina*, a plant found most commonly on the moraines of glaciers, and at far too great an altitude for the heat-loving *berissalensis*. In the summer of 1899 a short pamphlet was given to me by its author, Chanoine Favre, which I translated and published in the December number of the 'Entomologists' Record' for that year, vol. xi. p. 315, which was intended to be supplementary to Rühl's descriptions in the 'Societas Entomologica' and the 'Schmetterlinge,' in which Favre comes, after prolonged study of the insect in all stages, to the conclusion that it is not a variety of *athalia* but a distinct species; because it is double-brooded, the two broods appearing one before the other after the single brood of *athalia*; because it is specialized to certain food-plants, i.e., *Linaria officinalis*, on which the eggs

are invariably laid, and *L. minor*, on which the caterpillar feeds in preference after it is half grown; and because it has the following constant characters: (1) an elongated form of wing; (2) the two basal black lines on the fore wing straight and parallel; (3) the border of the hind wing upper side so broad as almost to cover the lunules; (4) the median light band of the hind wing under side very narrow and the general arrangement of that wing like that of *deione*. He then continues thus: "To these characteristics may be added the following, which are equally constant: on the under side of the fore wing, in the space corresponding with the lower portion of the median band, this species has always and invariably a black mark like a Y placed horizontally and opening outwards > thus, a mark which is not met with in any other species, not even in *deione*, which, as we have said, resembles it the most closely; this mark is also visible on the upper side of the same wings. On the under side of the hind wing, between the basal and median rows of spots, is a triangular spot, whose lower acute angle rests on the last spot of the basal band, which gives a slight resemblance to *M. deione* but to no other species. Its flight also is more sustained and less jerky." While fully concurring in the two latter distinctions, especially in his observation on the triangular spot which is conspicuously characteristic, I must observe that his remarks on the Y-mark go somewhat beyond what is warranted by more recently ascertained facts. In the first place, it is by no means so invariable in *berisalensis* as is here stated, the mark often becomes an italic *x* placed sideways, especially on the upper side, and occasionally like parentheses placed horizontally and back to back thus > ; sometimes it even becomes an oblong black patch, with mere indications of the fork of the Y at the outer corners. Secondly, the mark does frequently occur in *deione*, and the elements of it are, so far as I have seen, almost always present in that species, which we now regard as the type-form of *berisalensis*. Thirdly, it is not confined even to the different forms of this species; Mr. Prideaux has a male *athalia* from Wiesbaden in which it is very distinct, and it is also frequent in *britomartis*, either as a light mark enclosed in a black patch, or more rarely as the shape of the black mark itself. Although I am treating this insect separately, I still adhere to my previously expressed opinion that it is a local race of *deione*; of this I was at one time uncertain, but a comparison with Spanish forms seems to add great weight to this probability. They mostly agree more closely with this form than with the typical French races. Those specimens which I previously ('Butterflies of Switzerland') described as being *lighter* than the French prove not to have been Spanish at all, though Pyrenean, my informant apparently having taken it for granted that the latter implied the former! One further point occurs in Chanoine Favre's

pamphlet with regard to the name *berisalii* given by Rühl. This termination should of course refer to a person not to a place, and the Chanoine's Latinity being shocked by this, he used the correct form *berisalensis*, by which name it is almost universally known. Possibly those who make a fetish of priority will wish to return to the original barbarism; for myself I shall continue to use the form I have always employed. Are the rigorists prepared to return to "*schmidtiformis*"? I was not personally acquainted with Schmidt; still I hardly think that *any* butterfly can have mimicked his shape.

In order to compare the different species of the group with one another, it is necessary to summarize the general characteristics common to them all and to adopt a common terminology. For this purpose the following may be considered as the normal characters of the whole *athalia*-group.

Ground colour fulvous or orange-brown with black nervures and other markings. A comparison with the Argynnids and Brenthids, not to mention the *didyma*-group and such species as *parthenie* and *deione*, shows the fallacy of regarding the black part as the ground colour; indeed, *dictynna* is the only species that gives any excuse for this basis of description employed by some of the early entomologists, and unfortunately adopted by Kirby. This was pointed out long ago by Assmann in the Breslau 'Zeitschrift für Entomologie,' vol. i. p. 2 (1847). Fore wing, upper side. Black border. Two black lines of varying width and conspicuousness, nearly parallel to the border; these we will call the "*outer and inner subterminal lines*." Between the border and the outer subterminal line, the ground colour shows more or less in the form of lunules, the third of which, counting upwards from the anal angle, projects further towards the disc of the wing than the others, conspicuously so except in the case of *parthenie*, where this character is slightly marked, and of *varia* and *asteria*, where it rarely exists at all; the direction and curve of the inner subterminal line is a somewhat valuable character in determining the different species. Further towards the base is a sharply elbowed, almost sickle-shaped black line of very variable breadth, curving sharply out from the costa towards the outer margin, then inwards towards the base, and again somewhat outwards, spreading out and often dividing towards the inner margin; this we will refer to as the "*elbowed line*," and to the spread-out portion as the "*marginal blotch*." Beyond the elbowed line, nearer to the base, and starting from the first nervure below the costa, is a black spot, normally only outlined and filled in with the ground colour; this we will call the "*stigma*"; this frequently joins the elbowed line at its last bend, in such a way as to make it appear to form one line with the lower part of the elbowed line. Still nearer to the base are two narrow black lines, the "*basal lines*," slightly inclining outwards from the

costa, in a generally parallel direction to each other, but nowhere actually parallel, as both are irregularly curved and the curves are not parallel. Finally, there is a dark "*basal suffusion*" of varying extent.

Upper side, hind wing. The normal markings may be regarded as a black *border*, two black lines rather broken and nearly parallel to the border, which we will call the "*outer and inner lines*," a black "*discal spot*," and often a third or "*extra line*," and a black "*basal suffusion*" containing a spot of the ground colour. When this is not surrounded by the suffusion it is outlined in black; it may be called the "*basal spot*."

The under side fore wing has an orange-brown ground colour, and may be considered as reproducing the markings of the upper side. The black border is never present, but is represented by a fine, double, dark (usually black) line. The outer subterminal line appears as an inner edging to the lunules, which are lighter than the ground colour; the inner subterminal line is usually faintly visible; the elbowed line is generally represented by three conspicuous black spots near the costa (or four if there be one on the costa itself) and a black patch on the inner margin—the marginal blotch; the outlines of the stigma and the basal lines are narrow but conspicuous, and there is a black "*basal dash*" representing the basal suffusion.

(To be continued.)

NOTES AND OBSERVATIONS.

LYCENA ARION IN THE COTSWOLDS. — As the result of exploration during the last two years I have been able to discover the existence of this fine species in a number of out-of-the-way spots in the Cotswold Hills, which have never been recorded in any book or periodical. Its existence in some, however, is very insecure from the extremely circumscribed extent of the area which certain of the stations embrace. In some which have been recorded in the past it is now probably extinct. One such consists of the deserted quarries on the north-east side of Painswick Hill, although it is found sparingly in one or two other places not far away. It is here, however, much harassed by the Gloucester collectors, so that it will not be long before its final extirpation takes place in the neighbourhood of Painswick. In the vicinity of Cheltenham also it is persecuted a good deal by tyros. Some of the other stations discovered by me for the species are situated on private ground, and there is reason to believe that several more may be added to the list in the more remote "combs" well off the beaten track. In only one of these it occurs in any abundance according to my experience. As a consequence of the examination of a considerable number of specimens I am able to define the following aberrations.

tions of the species in the Cotswolds, for which I propose names as follows :—

(1) *Ab. pseudo-alcon*.—Aberration of male with the wings on the upper surface unspotted, and formerly erroneously considered to be the true *alcon* of Continental Europe. Rare.

(2) *Ab. imperialis*.—Aberration of female. An exceedingly fine form, generally of a brilliant blue, with the black spots on the upper surface of the anterior wings elongated into pearl-shaped streaks, giving them the appearance of a diadem or crown. Not uncommon here. This is of frequent occurrence in the South of France.

(3) *Ab. multo-maculata*.—Aberration of male and female with the posterior wings on the upper side possessing a corresponding series of spots as on the anterior wings, though much smaller and more or less indistinct. This is almost as plentiful as the typical form, which is without them.

(4) *Ab. marginata*.—Aberration of male and female with all the wings possessing very broad black margins. Not uncommon.

(5) *Ab. cotswoldensis*.—Aberration of male and female with all the wings more or less thickly sprinkled with black scales, giving it a very dusky or melanic appearance, constituting an approach to the alpine var. *obscura* of Professor Christ. Scarce.

(6) *Ab. pallida*.—Aberration of male and female of a pale washed-out appearance. Not uncommon.

(7) *Ab. occidentalis*.—Aberration of male and female. Very dwarf undersized specimens, some not larger than *L. ægon*. Of fairly frequent occurrence.

(8) *Ab. oolitica*.—Aberration of male and female of under side exhibiting fewer spots than in the typical form, some of them coalescing. Rare.—CHAMPION LE CHAMBERLAIN; Cheltenham.

NEUROPTERA FROM THE SOUTH OF FRANCE.—In January last Dr. T. A. Chapman gave me a small collection of Neuroptera taken by him at Gavarnie from the 9th till the 30th of July, 1907, whose names appear below. Mr. K. J. Morton was good enough to assist me with the identification of some of the specimens :—

ODONATA.—*Cordulegaster annulatus*, **C. bidentatus*, **Platycnemis latipes*, *Pyrrhosoma nymphula*, *Agrion mercuriale*.

PERLIDIA.—*Perla maxima*, *Chloroperla grammatica*, *Nemoura* sp., *Amphinemoura* sp. With the last three there must be unfortunately a little doubt as regards identification when males are not present.

PLANIPENNIA.—**Ascalaphus longicornis*, **A. coccajus* (a considerable number, all but one being females), **Panorpa meridionalis*, **Megalomus tortricoides*, *M. hirtus*.

TRICHOPTERA.—*Ecclisopteryx guttulata*, **Drusus monticola* (or nearly allied to it), **D. rectus*, **Sericostoma pyrenaicum*, *Hydropsyche pellucidula*, *Philopotamus montanus*, **Rhyacophila tristis*.

With these were also two insects taken at Cauterets from the 1st till the 8th of July—one *Chloroperla grammatica*, which is subject to the same doubt as the specimen above; and one female *Ascalaphus coccajus*. The insects with which an asterisk (*) is placed are non-British species.—W. J. LUCAS; Kingston-on-Thames.

CAPTURES AND FIELD REPORTS.

AGROTIS YPSILON IN EARLY JULY.—While sugaring on the sand-hills at Deal on Saturday last, July 4th, I found a very worn *Agrotis ypsilon*, male, on one of the patches. I took it to make quite sure of its identity. Surely this is a very late date for a hybernated specimen, more particularly a male? I see in South's 'Moths of the British Isles' a suggestion that this species migrates, so possibly this record may be of interest if the question of its migration is not yet established.—P. A. CARDEW (Capt. R.A.); St. Aldwyns, Park Avenue, Dover, July 6th, 1908.

PLUSIA MONETA AT PETERBOROUGH.—The following item may be of interest in your "Field Captures" column:—*Plusia moneta*. I was fortunate enough to take a good specimen of this on July 5th, 1908, about 11.30 p.m., on a mixed herbaceous border in my garden, Broadway, Peterborough. I have not heard of its being taken in this district before, and should be glad to hear if there is any record of its capture so far north or in this neighbourhood. —GEO. T. NICHOLS; Peterborough, July 7th, 1908.

ACIDALIA EMUTARIA IN SUSSEX.—This insect, which has only once before been recorded as taken in East Sussex, was found by myself and Mr. W. Jarvis in some numbers while searching for *Senta maritima* in the valley of the Cuckmere; we also found the species, but in lesser numbers, on the Ouse, while trying to turn up *S. maritima* on that river. The only other record, as referred to above, is nearly thirty years old, a single specimen having been taken in the Lewes Marshes (Ouse) by Mr. J. H. H. Jenner, F.E.S., of this town in 1880.—A. J. WIGHTMAN; Lewes.

ARGYNNIS PAPHIA VAR. VALESINA IN GLOUCESTERSHIRE.—I sent a note to this journal in 1906 stating that *Argynnis paphia* var. *valesina* occurred in woods near the town. Yesterday I was strolling through the same woods, and again had the pleasure of viewing it at the bramble-blossoms amongst a number of the ordinary type, all in fine condition. *A. aglaia* was also fairly abundant, but appeared to be rather worn. *Melanargia galatea* has been, and still is, the commonest butterfly on the hill-sides this season.—V. R. PERKINS; Wotton-under-Edge, July 21st, 1908.

HYLOICUS PINASTRI IN THE BOURNEMOUTH DISTRICT.—It may interest you to know that while dusking in my garden last night, I captured at honeysuckle a fine specimen of *Hyloicus pinastri*. I have not heard of any previous records of this insect in this neighbourhood, and it will be interesting to observe if other captures follow this one. Branksome Park would seem to be favoured by Sphingidæ, for within the last four years my garden has yielded me no fewer than seven species, viz.:—*Sphinx ligustri*, *S. convulvi* (eight), *Smerinthus populi*, *S. ocellatus*, *Phryxus livornica* (one), *H. pinastri* (one), and *Macroglossa stellatarum*.—EDWARD P.

REYNOLDS ; Headinglea, Branksome Park, Bournemouth, July 12th, 1908.

SENTA MARITIMA IN SUSSEX.—During the present season, together with my friend Mr. W. Jarvis, of this town, I have been successful in finding *S. maritima* and its vars. *bipunctata* and *wismariensis* in Sussex. The species is very local, and not by any means plentiful among the thick reed-beds in the valley of the Cuckmere. It may also be interesting to note that *C. senex* and *L. straminea* also occur in the same locality. I think I am correct in saying that *S. maritima* has never before been recorded from this county, and both *senex* and *straminea* are considered very rare on our East Sussex list.—A. J. C. WIGHTMAN ; Lewes.

LEPIDOPTERA IN THE SALISBURY DISTRICT.—Possibly the following captures which I have made up to now this season may be of some interest to your readers. In April last I captured one specimen each of two "pugs," *Eupithecia consignata* and *E. irriguata*. Both were taken at street-lamps in the town. Three weeks ago I captured a remarkable aberration of *Eupithecia rectangulata*. It was black on all four wings, with the veins strongly marked with silver-grey metallic scales. Had it not been for the shape of the insect I could not have identified it. On June 29th and 30th and July 1st I captured *Triphæna subsequa* at dusk on the heath at Whaddon, Wilts. I took altogether ten specimens, and saw several more which I could not capture. I fancy this insect has not previously been recorded for this county, although I took four specimens two years ago at Clarendon Wood near here, which I did not record at the time. But what struck me as remarkable was the fact that I had previously worked the heath very assiduously for three years without seeing a single specimen, and now they crop up in such large numbers. And again, last Sunday I captured a specimen of *Limenitis sibylla* at the side of the same heath, and saw others flying around the tops of the oak-trees. Is not the date, July 5th, somewhat early for this insect? I also took several specimens at this same locality last year, but did not see the first specimen until July 19th last year! Another fact seemed to me remarkable. On July 14th this year *Argynnis selene* was out in swarms on the heath, and *A. euphrosyne* was over. On July 5th only two specimens of *A. selene* were seen there all day, and they were both very badly worn. And yet last year they were only just emerging about the middle of July!—W. A. BOGUE ; Salisbury, July 7th, 1908.

DEILEPHILA EUPHORBIE AT BOURNEMOUTH.—On July 12th, 1908, whilst taking *Heliothis dipsacea* at Canford Cliffs, Bournemouth, I disturbed from privet (in flower) a female *Deilephila euphorbiæ*. This was near the edge of cliff where I took *D. livornica* two seasons ago. It is in good condition.—W. G. HOOKER ; 125, Old Christ Church Road, Bournemouth.

NONAGRIA DISSOLUTA VAR. ARUNDINETA, ETC., IN SUSSEX.—On the 22nd inst., when collecting *Senta maritima (ulvæ)* in the Cuckmere Valley with my friend Mr. A. J. Wightman, of Lewes, I also took

N. arundineta. I believe the latter has not been recorded for Sussex before.—EDWIN P. SHARP; 1, Bedford Well Road, Eastbourne.

SPRING NEUROPTERA AT BUDE.—I received from Dr. T. A. Chapman six insects taken at Bude in Cornwall on May 28th, 1908. They were *Isopteryx torrentium*, one; *Panorpa germanica*, one male; and *Limnophilus centralis*, four.—W. J. LUCAS; Kingston-on-Thames

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, June 3rd, 1908.*—Mr. H. Rowland-Brown, M.A., Vice-President, in the chair.—Mr. H. St. J. Donisthorpe brought for exhibition pseudogynes of *Formica sanguinea*, caused by the presence of the beetle *Lomechusa strumosa* in the nest, from the New Forest.—Mr. H. J. Turner showed living larvæ of *Coleophora maritimella* on *Artemisia*, and also a species of Asilidæ and its prey.—Mr. C. J. Gahan exhibited living specimens of a "leaf-insect" from the Seychelles, bred in England by Mr. St. Quentin, probably *Pulchriphyllium crurifolium*, Serville; and Lampyridæ of considerable interest collected by Mr. E. E. Green in Ceylon, including both sexes of the genera *Lamprigera* and *Diophtoma*, the larviform females of which had hitherto been unknown. He called attention to the existence in China, Ceylon, and the Malay Peninsula of remarkable larviform females greatly resembling in form the females of the American group *Phengodini*, and being somewhat similarly provided with rows of luminous points. Mr. R. Shelford remarked that in several of the Malacoderm Coleoptera from the Malay Archipelago, regarded as larval or apterous forms, the males and females were indistinguishable, and underwent practically no metamorphosis.—Mr. G. C. Champion, specimens of *Dromius angustus*, Brullé, and *Cryptophagus lovendali*, Ganglb., recently recorded by him from Woking and the New Forest respectively; also two species of the Staphylinid genus *Leptotyphlus* and one of the Curculionid genus *Alaocyba*, minute blind South European insects, much smaller than any known British representatives of the groups in question.—Col. C. Swinhoe, several boxes of butterflies taken by him during the present year (1908) in the Canary Islands, chiefly from Grand Canary and Teneriffe. He drew attention to the fact that with the exception of *Lampides webbianus*, all the species met with suggest a foreign origin.—Mr. J. E. Collin communicated "Notes on the Value of the Genitalia of Insects as Guides in Phylogeny," by Mr. W. Wesché, F.R.M.S.—Dr. D. Sharp, M.A., F.R.S., communicated a paper "On certain Nycteribiidæ, with Descriptions of Two New Species from Formosa," by Mr. Hugh Scott, B.A. (Cantab.).—Dr. J. L. Hancock, M.D., communicated a paper on "Further Studies of the Tetriginæ (Orthoptera) in the Oxford University Museum."—Mr. J. C. Moulton read a paper on "Mimicry in Tropical American Butterflies."—Professor E. B. Poulton, F.R.S., read a paper on "Hereditry in *Papilio dardanus* from Natal, bred by Mr. G. F. Leigh, F.E.S., of Durban," and exhibited, in illustration, a large series of the forms of *P. dar-*

danus from Natal and Chirinda.—Mr. Hamilton H. Druce, F.L.S., read a paper on "New Species of Hesperiidæ from Central and South America," and exhibited the specimens described; also a series of the subfamily Pyrrhopyginae, together with the genus *Erycides* of the subfamily Hesperinae, showing the great similarity of some of the species with those of the Pyrrhopygine genus *Jemadia*, and also pointed out that the subfamily Pamphilinae contained genera with species again almost exact copies of those shown in the two previously mentioned subfamilies.—Mr. F. Merrifield proposed a vote of thanks to the Fellows who had been instrumental in the organization of the Conversazione, and the Vice-President begged to be allowed to mention in particular the services rendered by Mr. R. Adkin and Mr. Stanley Edwards, who had undertaken the whole work of arrangement in connection with the exhibitions. The vote of thanks was unanimously given.—J. J. WALKER, M.A., R.N., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May 14th, 1908*.—Mr. Alfred Sich, F.E.S., President in the chair.—Dr. Chapman exhibited a larva of *Lycena semiargus* from a Pyrenean ovum, nearly full grown, and he called attention to the curious fine brown scaling in a bred Pyrenean example of *Tanagra atrata*.—Mr. Adkin, from Mr. McArthur, from Aviemore, nodules of resin on twigs attacked by *Retinia resinana* larvæ, a curious "mop" of twigs on a branch of fir, no doubt caused by a gall, and cocoons of *Dicranura vinula*, opened by birds?—Mr. Harrison, a living larva of *Phorodesma smaragdaria*.—Mr. Newman, larvæ of *Dryas paphia*, *Argynnis aglaia*, and *A. adippe*; one set had been wintered outdoors and were very small, the others kept in a cool house were in their last instar. He showed ova of *Vanessa atalanta* just hatching.—Mr. Edwards, specimens of *Papilio astorion* and *P. philoxenus* from North India, and *P. warscewiczii* from Bolivia.—Mr. Rayward, a considerable number of Lepidoptera, which he was placing in the Society's cabinets.—Mr. A. H. Jones, a number of butterflies taken in Hungary to illustrate his paper, "Notes on Hungarian Butterflies," including *Neptis lucilla*, *N. aceris*, *Limenitis populi*, *L. camilla*, and *L. sibylla*, taken together in one forest opening; *Chrysophanus alciphron*, extremely large and boldly marked; *Colias myrmidione* ab. *alba*, a parallel form to var. *helice* of *C. edusa*; the local *Erebia melas* (with which he had placed *E. lefebvrei* from the Pyrenees and *E. glacialis* v. *nicholli* from Campiglio for comparison); *E. medusa* var. *psodea*, *C. thersamon*, *Pararge climene*, *P. roxelana*, *Cænonympha ædippus*, &c.

May 28th.—The President in the chair.—M. J. St. Aubyn, of Balham, and Mr. N. D. Riley, of Upper Tooting, were elected members.—Mr. Main exhibited living larvæ of a species of "Stick" insect.—Mr. West (Ashtead), a series of *Anticlea badiata* bred from larvæ taken on his rose trees.—Mr. Tonge, stereoscopic views of the ova of *Saturnia carpini* and *Macrothylacia rubi*; of the ova of *Malacosoma castrensis* and *M. franconica*; and of fertile and infertile ova of *Panolis piniperda*.—Mr. Newman, pupæ of *Dryas paphia*, *Argynnis adippe*, and *A. aglaia*.—Mr. Rayward, pupa *in situ* of *Trochilium crabroniformis*, and pupa case of *Ægeria culiciformis*. The former emerged downwards and the latter upwards.—Mr. Carr,

an imago and cocoons of *Earias chlorana*.—Mr. Turner, a long series of *Pancalia lewenhoekella* from Box Hill; a short bred series of *Swammerdamia griseo-capitata* from Oxshott; and the very beautiful Hydrocampid, *Ambia instrumentalis*, from North India.—Mr. Gilbert Arrow gave an address, with lantern slides and numerous specimens, on "The Origin and use of Horns in Coleoptera."

June 25th, 1908.—Mr. Alfred Sich, F.E.S., President in the chair.—Mr. Tonge exhibited a large species of mayfly (*Ephemera*) in the penultimate stage.—Mr. Goulton, living larvæ of *Tethea subtusa* taken in Surrey.—Mr. Rayward, batches of ova of *Macrothylacia rubi* found on heather tops at night, when they were very conspicuous.—Mr. Edwards reported the capture at Blackheath of a male and female *Amphidasys betularia* var. *doubledayaria* in cop.—Various members gave notes on this season's captures and observations.—HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. May 19th, 1908.—Rev. C. R. N. Burrows and Mr. F. N. Pierce exhibited about one hundred imagines of the *Hydræcia nictitans* group, including eighty-seven specimens, the genitalia of which had been mounted for the microscope and were also exhibited. As a result of the examination of male genitalia the specimens had been separated into four groups:—(a) *H. nictitans* (the woodland form), (b) *H. paludis* (marsh form), (c) *H. lucens* (Lancashire moss form), (d) an apparently new species, at any rate as regards Great Britain, taken by Messrs. Bacot and Simes on the banks of the Crinan Canal, N.B., and provisionally named *crinanensis*. A single specimen received from Dr. Chapman, labelled "Turkestan," also belonged to this latter species. Rev. Burrows stated that a less extensive examination of female genitalia indicated the probability of their being equally easy to differentiate; he also pointed out that with the aid of wood naphtha it was possible to examine the genitalia *in situ*, and thus avoid mutilating the specimen.—S. J. BELL, *Hon. Sec.*

BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—The newly constituted Entomological Section (the old Birmingham Entomological Society) held its first meeting after the amalgamation on April 13th, the President, Mr. Geo. Bethune-Baker, F.L.S., F.Z.S., F.E.S., in the chair.—The resignation of Mr. Colbran J. Wainwright, F.E.S., from the hon. secretaryship, after nineteen years' service, was received with great regret, and Mr. A. H. Martineau was elected to fill the office for the present year.—The President exhibited and described some Lycænidæ from Australia, all of which are associated with ants during some portion of their life-history.—Mr. H. Wiloughby Ellis, F.Z.S., F.E.S., gave an account of the present knowledge of British Myrmecophilous Lycænid larvæ, and gave a list of records to date with remarks on the methods employed by the ants in obtaining the juices from them. He also gave an account of the British Myrmecophilous Coleoptera, with special mention of the work he and Mr. A. H. Martineau had carried out in the Midlands during the past year.—Mr. A. H. Martineau showed specimens of *Formicoxenus nitidulus*, Nyl., from the nests of *Formica rufa*, L., at Knowle (Warwickshire).—Mr. Herbert Stone, F.L.S., showed a piece of

marble-ebony sapwood, showing ebony around the galleries of insects, also lancewood similarly ebonized.—Mr. Hubert Langley, specimens of *Asthenia pygmaea*, Hb., and *Anybia epilobiella*, Roem., both from Princethorpe, both being additions to the Warwickshire list.—Mr. H. Willoughby Ellis read a short paper on the present knowledge of the genus *Dinarda*, Grav., embodying the work of Donisthorpe and Wasman; also his own observations of the species collected from the nests of *Formica rufa*, L., and *F. sanguinea*, Latr., and from a number of specimens received from friends.—ALFRED H. MARTINEAU, *Hon. Sec.*

RECENT LITERATURE.

Additions to the Wild Fauna and Flora of the Royal Botanic Gardens, Kew. VII. (Bulletin of Miscellaneous Information, No. 3, 1908.)

ENTOMOLOGISTS will be interested in this number, which contains a list of Coleoptera and ants contributed by Mr. H. St. J. Donisthorpe, and one of Aphidæ and Coccidæ by Mr. R. Newstead. Of the four lists, that of the ants seems of greatest interest, owing to the number of non-British species it contains.

Nuevo Tricóptero de Espana. (Boletin de la Real Sociedad espanola de Historia natural.) By R. P. LINGINOS NAVÁS, S.J. Illustrated. April, 1908.

Leptocerus zapateri, the new species, is described in Latin, and named after B. Zapater, lately dead, a friend of Navás.

W. J. L.

OBITUARY.

WITH very great regret we have to record the death of Mr. W. H. THORNTHWAITHE, on June 27th last, aged fifty-eight years. Only a fortnight previously he conducted a party of the members of the South London Entomological and Natural History Society to some private ground at Box Hill; and he himself was then keenly engaged in collecting Tortrices, &c., and seemed in no way distressed by his labours on the rough hillside. On the evening of June 25th, when dining at the Savoy Hotel, he was suddenly attacked by his fatal illness. Although he rarely contributed to the literature of his study, Mr. Thornthwaite had amassed a considerable collection of British Lepidoptera, both "Micro" and "Macro"; and quite recently he was busy in rearranging the Pterophoridae and other groups in accordance with the most recent classification. For a number of years he had been Chairman of the Board of Directors of the Gresham Life Assurance Society, and this position he held at the time of his decease. By all who knew him he will be greatly missed.

WE are also very sorry to hear that Mr. THOMAS MADDISON, F.E.S., died suddenly on July 16th last while on a visit to Scarborough.

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JOTTINGS ON APHIDES TAKEN DURING 1907 AND 1908.

BY CLAUDE MORLEY, F.E.S., &c.

SOME notes upon the results of a few months collecting Aphididæ may not be entirely without interest, since the family is so generally shunned by the "pure entomologist" that one never sees anything respecting it in current literature. Last year I was anxious to add to the six thousand species which constitute the known insect fauna of Suffolk, and began to name such Aphides as I saw with the aid of the four volumes of Buckton's 'Monograph of the British Aphides,' published by the Ray Society, 1876-1883. This I have followed with slavish exactness, and have succeeded, by examining the insects while hardly dead, in naming *every specimen* whose food-plant was known to me with conscientious certainty, which reflects high credit upon the Monograph, though one could sometimes wish the figures were less artistic and more scientifically drawn, and the descriptions fuller. It is, however, often impossible to determine single-winged specimens found on, very probably accidental, plants. I had no previous knowledge of the subject, which I approached from the point of view of the species' pabulum; I drew up a list of every food-plant indicated by Buckton—one hundred and ninety-eight indigenous kinds—and found it an invaluable guide in the absence of specific tables. Several, usually many, individuals of a species occur together, so that it may be carded in various advantageous positions in its larval, pupal, and dimorphic perfect states (I have taken no males, which are rare and always autumnal); but the examination must be immediate, since the colours are evanescent and the form shrivels. Except where stated, the following were taken during these two years in the garden at Monks Soham House, Suffolk. Aphides were abundant everywhere in 1907, but during 1908 their scarcity is very remarkable.

The first of the Aphidides group of the subfamily Aphidinae, and one of the most prevalent, was *Siphonophora rosae*, Linn., which was seen upon the young shoots of both wild and cultivated roses throughout the summer, as well as upon the under side of the leaves of adjacent *Aquilegia vulgaris* at the end of July; from these latter I bred several parasitic Aphidii. *S. scabiosae*, Schr., I have not found here, but I took many apterous females and larvæ on the stems of an unrecorded food-plant, *Dipsacus sylvestris*, at the Haven Street Woods, in the Isle of Wight, at the end of June, 1907. It was August 22nd last year before I looked for *S. granaria*, Kirby, but harvest had hardly begun, and I at once found both imaginal forms commonly on some adventitious ears of wheat in the garden, though all these were dead (fourteen of them on one ear had been "stung," and will doubtless produce Buckton's *Ephedrus plagiator* or *Lygocerus carpenteri*, cf. Marshall, Bracon. d'Europ. ii. 544), and one or two live apterous females on barley-ears in adjacent fields. Apterous *S. hieracii*, Kalt., were very rare beneath the flower-heads of *Hieracium* in early August, associating with a few females and pupæ of *Aphis rumicis*. As early as June 1st larvæ of *S. millifolii*, Fab., appeared on the flower-stalks of *Chrysanthemum segetum*, and in early August both winged and apterous imagines have been fairly common on the stem of both this plant and *Achillea millefolium*, becoming abundant by the middle of the month. No Aphid has been specified as the victim of *Diodontus tristis*; on 17th last year I saw a female of this Fossor alight on a flower-head of *C. segetum*, about 2 p.m. in dull and windy weather, walk below the flower, down the stem, over three or four larvæ of the *Siphonophora*, of which she seized the following one in her mandibles with a sudden snap; she immediately rose in the air, and, after one or two circlings, made off with it; the larva was about one-third grown (cf. Buckton, ii. 167). At the end of July I have found *S. pisi*, Kalt., in all its stages, not very commonly on garden peas and the leaves of *Bursa bursa-pastoris*; it is not common enough to have been a pest either year. In 1903 I took it near Ipswich on *Urtica dioica* as late as October 27th. *S. rubi*, Kalt., has not been observed till the first week in August, when both imaginal forms and quite young larvæ occur on the under side of leaves of *Rubus fruticosus*, with *Aphis urticariæ*. *S. urticæ*, Kalt., has been scarce; I have taken only one apterous female, still attached to the pupal skin, on *Urtica dioica*, on August 2nd. The distinct *S. avellanæ*, Schr., also appears rare, since of this I have only found an apterous female beneath a leaf of *Corylus avellana* early in June. Larvæ, pupæ, and apterous forms of *S. tanacetii*, Linn., abounded in the heart of a constantly-mown dandelion on a lawn on August 13th, 1907. Beneath leaves of *Tussilago farfara* numerous dead *S. tussilaginis*, Walk., both winged and apterous, with a few larvæ, were found early in the

same month, and a diligent search revealed but two live alate forms. *S. sonchi*, Linn., in its apterous form, is one of our commonest species on *Centaurea nigra* in May; on the 31st I have taken several "stung" females, from which the Braconid, *Aphidius granarius*, Marsh., emerged on June 1st, and subsequently several Cynipids; the same form was found on *Cnicus arvensis* in August. This species does not attack *Sonchus oleraceus*, which was abundant in this vicinity till quite the end of July, when the apterous and alate forms, together with their pink (not black, as on knapweed) larvæ, are abundant in the heads and on the stems, and have continued so to the present time; on August 13th last year I observed a female *Bassus tarsatorius*, Panz., investigating, without apparently attacking, a brood of these Aphids. There is no *Cichorium intybus* here, but I have found larvæ, pupæ, and apterous imagines (a few of which latter were "stung") of *S. cichorii*, Koch, upon the stem, just below the flower, of this plant near Easton Park, Suffolk, on August 17th; no winged specimens were seen there nor on the same plant at Dunwich, in Suffolk, where it occurred sparingly in September. Five *S. olivata*, Buck., were taken on *Cnicus palustris* in the Bentley Woods, near Ipswich, August 11th, 1904. I have searched in vain (fortunately) for *S. lactuæ*, Kalt., and (unfortunately) for *S. convolvuli*, Kalt., in my garden.

The small *Phorodon humuli*, Schr., was abundant, though I could detect no winged forms and but few apterous imagines covering the under side of leaves of *Humulus lupulus*, near Easton Park on August 17th last; and a protracted examination of *Lamium album* in my garden revealed a solitary winged and active *P. galeopsidis*, Kalt., on the under side of a leaf, on the 2nd of the same month. On June 7th, 1907, twenty-three *Myzus cerasi*, Fab., in all its stages though only two winged, were given me from *Prunus cerasus* in this parish, where it is doubtless but too common; and early in August I have found *M. ribis*, Linn., rarely on the under side, near the midrib, of leaves of *Ribes rubrum* in my garden—larvæ were then the commonest form, and only one alate specimen was seen. Quite suddenly, on August 4th last, *Drepanosiphum acerina*, Walk., appeared commonly beneath maple-leaves and the adjacent hazel and *Cornus sanguinea*; the winged form is always much the commoner, though I have seen three apterous ones beneath a leaf with it and many more singly. It is the most active Aphid I know, and takes flight at once, in sun or shade, upon being disturbed, though more sluggish towards dusk; it also possesses a feeble power of leaping. Apterous females, larvæ, and pupæ of the distinct and presumably rare *Megoura viciae*, Buck., were found very commonly feeding upon the pods and stems of one plant of *Lathyrus pratensis* in a meadow near Easton Park on August 17th last. Early in June *Rhopalosiphum ribis*, Linn., has been found in hundreds in all its stages

in leaves of *Ribes nigrum* in my garden; these they curl, and the habitation so formed also gives protection to Syrphid larvæ, which work great havoc among these Aphids. Three of the latter pupated on the 8th, and became perfect *Syrphus ribesii*, Linn., towards the end of the month.* *R. nymphææ*, Linn., was abundant on the stalks of *Alisma plantago* in July, and also on *Nymphæa alba* in August in the moat which surrounds my house, both this and last year, but among thousands of the apterous forms I could find but a single winged specimen; I omitted to breed the parasitic Cynipid (not Braconid, cf. Buckton, ii. 153), *Allotria erythrocephala*, said to so extensively and beneficially prey upon it. A very few winged females and pupæ only of *R. ligustri*, Kalt., were taken on August 2nd, 1907, on the under side of leaves, just below the flowers, of *Ligustrum vulgare*. Exclusively winged forms of *Siphocoryne pastinacææ*, Linn., have been found on the flower-stalks of wild *Daucus carota*, both here and in the adjacent parish of Bedfield, in early August; also on broad beans in my garden in early June. *S. xylostei*, Schr., is a curse on *Lonicera periclymenum* over the house-windows, though, curiously enough, honeysuckle in the garden and orchard a hundred yards away appears exempt; in such numbers are they that in 1906 the flowers were all distorted and aborted. *S. caprææ*, Fabr., occurs commonly at the apex of the shoots and sparingly in the centre of the under side of young leaves of *Salix alba*, like *S. xylostei*, throughout the summer. The only *S. fœniculi* I have seen are three examples, one of which was "stung," on fennel at Dunwich, by the roadside, in the middle of last September.

(To be continued.)

NOTES ON SOME ANDALUSIAN BUTTERFLIES.

BY W. G. SHELDON, F.E.S.

THAT most delightful experience, a spring holiday on the Mediterranean, has become an annual necessity to those of us whose pursuits are entomological or otherwise, and who have once tasted its joys.

We all, of course, first make for the Riviera, and revel in the sunshine and in the clouds of butterflies there to be found from

* William Kirby wrote Letter IX. of the 'Introduction to Entomology,' and it must be Barham Parsonage, Suffolk, to which he refers when he says (7th ed. p. 152):—"It was but last week that I observed the top of every young shoot of the currant-trees in my garden curled up by myriads of these insects. On examining them this day, not an individual remained, but beneath each leaf are three or four full-fed larvæ of aphidivorous flies, surrounded with heaps of the skins of the slain, the trophies of their successful warfare." Evolution seems slow in these matters. Perhaps their government is not "progressive"!

March to May; but a very few holidays so spent exhaust the novelty of even the numerous species of this favoured clime, and we sigh for new worlds to conquer.

After the "côte d'azur" one's thoughts naturally fly to Andalusia, for one gathers from 'Baedeker' that the climate is at least as enjoyable, and favourable to the production of spring butterflies, as the shores of the French Mediterranean; at Granada, Cordova, and elsewhere, exist magnificent remains of a civilization which a thousand years ago was the most advanced in the world; the peerless Sierra Nevada, rising some 12,000 ft. out of the sea, is there; and there Europe makes its nearest approach to the tropical in climate, producing sugar-cane, custard-apples, and other fruits and plants in profusion, whilst, most important of all from one point of view, certain charming Diurni are in Europe only found there, and of those occurring which are found in Europe outside Spain several have forms peculiar only to that country.

Andalusia all the winter had been the subject of my meditations, and arrangements being made, I left England accompanied by my wife and daughter on April 2nd last, travelling by the long overland journey *via* Barcelona and Madrid.

Stoppages at these and other places made it the 12th of April before we reached Andalusia, at Cordova, where we stayed a couple of days to see the mosque and other sights. I did not do any actual collecting at Cordova, but found the environs very pretty and, incidentally, saw a good many butterflies, including *Euchloë euphenoides*, and something that looked like *Anthocharis belemia*; no doubt good work could be done by devoting a little time there. On the 14th we journeyed on to Ronda, some six hours ride by rail, where we contemplated staying a week.

Ronda is very beautifully situated in the midst of a grand amphitheatre of mountains, at a height above the sea of about 2500 ft.; the town is cut in two by a fine gorge, formed by the river Guadalevin, 350 ft. deep, and spanned by a bridge of a single arch. Ronda has other features not so inviting; the usual adjuncts of sanitation are practically non-existent, and it is certainly the most malodorous town I have ever stayed in; the occupation of a large portion of the adults, and practically of all the children, consists of mendicity, and they are most pertinacious and annoying in the exercise of their profession. Vultures abound, and it is a grand sight to watch these immense birds come sailing up the huge gulf in the mountains below the town, to see if any horses have been thrown out of the bull-ring for them to feed upon. The weather, which had been magnificent for weeks previous to our arrival, broke up on the day we came, and for four days I did not see an insect fly; on the 19th, however, the sun rose in a cloudless sky, and having well explored the ground previously, I started betimes; it was well I

did so, for the sky gradually clouded over, and in the early afternoon the sun was hidden for the day. The best, and probably the only good collecting ground at Ronda, is to be found on the right bank of the Guadalevin, some mile and a half below the town, immediately where the river leaves the meadows and enters a gorge; this ground extends down the bank of the river a mile or more, and is especially good on the top of the cliffs just before the river enters the gorge; it is best reached by walking along the top of the cliffs, past the Hotel 'Reina Victoria,' and the new cemetery. On this spot butterflies were very numerous, the most abundant species being easily the very local *Anthocharis tagis*, which of course in its type form is in Europe peculiar to Southern Spain. *A. tagis* has much the habits and flight of the Provence form of the species, var. *bellezina*, like it floating slowly along the edge and upper portions of the precipices it haunts, though one meets with it more sparingly on the lower slopes and down by the river. It is said by Lang and Kane to feed upon *Iberis pinnata*; I do not know this plant, but an *Iberis*, white, about six inches in height, and not very far from the old garden candytuft, was growing, wherever I saw the butterfly at Ronda and elsewhere. The female settled upon it repeatedly, but though searching carefully I could not find any ova; I did, however, find a larva, which fed up and pupated; this larva and pupa closely resembled the description of *A. tagis* given in Lang, though it might have been *A. belemia*. Unfortunately it has since died, so the question of its identity will not be solved. I have, however, little doubt but that this *Iberis* is the food-plant of *A. tagis* in Spain; the specimens captured, some thirty in number, were in very good condition. With this species flew, in less numbers, another Andalusian speciality, *A. belemia*, the only typical specimens I saw in Spain, and its var. *glauce*. I think *A. belemia* is the swiftest winged butterfly I have ever viewed flying; those who have seen *A. belia* on the wing will appreciate what I mean when I say that in my judgment *A. belemia* could give the other species twenty yards in a hundred; it is of course quite useless to attempt to run it down, but this butterfly becomes an easy victim once its habits are known. Like other Diurni, it has a weakness for flying along the edge of a ridge, or, better still, round and round a knoll; one can stand there and intercept it in flight quite comfortably, and one may strike again and again without in the least alarming it. *Thais rumina* was common, but most of the specimens were in bad condition; I saw but missed a fine deep yellow form, which could not be far from ab. *canteneri*, and was certainly the best form I saw in Andalusia. Most of the *T. rumina* one sees in collections have the ground colour of the wings very little, if at all, more richly coloured than those of the French form var. *medesiaste*, and very few of them are of so strong a yellow tint as

the figure in Lang's book; of the specimens I obtained in Andalusia, not more than twenty per cent. would resemble the example figured in depth of colour. A species that I did not expect to meet with here was *Melanargia ines*, of which I netted a few males. *Anthocharis belia* was common, examples both of the first and of the second broods were captured in some numbers. *Euchloë euphenoides* occurred not infrequently down by the river in the gorge, and two or three battered specimens of *Papilio podalirius* var. *feisthamelii* flew wildly on the top of the cliffs. Of other species I noted *Pontia daplidice* var. *bellidice* common, and *Pararge megæra* and a skipper I have not yet been able to name; it is of the *Hesperia alveus* group, but is not *H. alveus*.

The following morning, April 20th, looked equally promising, early, and this being my last day at Ronda, I decided to devote it to a search for *Cupido lorquini*, which my friend Mr. E. F. S. Tylecote met with some years ago not infrequently in the mountains some four or five miles east of the town; this proved a fatal error of judgment on my part, for, although the valley round Ronda basked in the sunshine all the morning, clouds soon gathered, and persistently hung round the summits I was amongst, and consequently my attempt resulted in a failure: this turned out to be even more disastrous than I then realized, for I did not succeed in meeting with *C. lorquini* elsewhere in Andalusia.

On April 21st we went on to Algeciras, where we stayed until the 29th. I did not find Algeciras a very fruitful locality for Lepidoptera; there were a few *Anthocharis belemia* var. *glauce*, *Thais rumina*, *Euchloë euphenoides*, and some other species of general distribution, flying in the vicinity of the well-known waterfall, two miles back in the mountains; and I netted a fine specimen of *Pyrgus proto*, and saw a very large hybernated example of *Eugonia polychloros*. The best ground for butterflies in the district is, undoubtedly, the very beautiful cork-woods of Almoraima, some nine miles inland; these woods are many miles in extent, and are intersected in places with impassable swamps; the ground containing many specimens is very limited in extent, and almost impossible to find unless you have a guide. I was, however, fortunate in meeting, on my first journey there, with Colonel Willoughby Verner, who resides at Algeciras during a portion of the year, and whose researches in Andalusian ornithology are so well known. Colonel Verner was out on an expedition after birds, and seeing I was a stranger most kindly took me in hand and piloted me to the best locality in the woods, which is some three or four miles east of the railway station, and consists of a group of kopjes, about 200 ft. high, and the valleys or depressions between them. Here I found *Thais rumina* abundant and in fine condition; *Euchloë*

euphenoides also was common, and amongst the white *Iberis* noticed at Ronda *Anthocharis tagis* flew in some numbers; these *A. tagis* were, however, a remarkable race, much larger than the Ronda specimens, and having an average wing expanse of 45 mm., whereas the majority of the specimens taken at Ronda and Granada—the only other places I met with the species in Spain—did not average more than 38 mm. in expanse; this large form had also a much more powerful and swift flight, and was, on the wing, not distinguishable from *A. belia*. Other species observed were *Nomiades melanops*, *Pararge egeria*, *Polyommatus agestis*, and *Pontia daplidice*. *Colibris edusa* was common. *Epinephela pasiphaë* was just emerging, and females were found on April 27th. Apart from the Lepidoptera, the cork-woods are well worth a visit for their wonderful avifauna. Thanks to Colonel Verner, I saw or recognized the notes of a great number of most interesting birds, including bee-eater, hoopoe, golden oriole, kite, and Egyptian vulture (on nest), and was informed that pairs of goshawk, Bonelli's eagle, marsh harrier, and other Raptores were then nesting in the woods.

In the Alameda gardens, at Gibraltar, the larvæ and curious pupæ of *Zygæna bætica* were not infrequent on *Coronilla glauca*.

The weather during my stay was very delightful, with a good deal of sun each day and a minimum shade temperature of about seventy-five degrees.

On the morning of April 29th we travelled on to Malaga, a ten hours journey; this route is a very attractive one, traversing some fine gorges, and with splendid mountain views most of the distance. As we approached Malaga the train passed for many miles through orange orchards, which loaded the air with the perfume of their blossom. Large birds of prey were seen at intervals, and a pair of magnificent eagles hovered quite close to the train in a gorge a little to the south of Ronda, where they were evidently breeding.

Malaga enjoys the highest mean temperature of any locality in Europe, and consequently produces certain tropical plants that are not grown elsewhere, including the sugar-cane, large plantations of which exist; custard-apples and bananas are also extensively grown. The weather was cloudless during our stay, but abnormally hot for the time of the year, the shade temperature each day running well up to ninety degrees, and on one day it reached ninety-six degrees.

The town is very dusty and insanitary, but the surroundings are picturesque; it is better, therefore, to stay in the suburbs, and we found charming quarters at an English pension, the 'Hacienda de Giro,' an old Spanish mansion situated in the midst of a beautiful tropical garden in the suburb of Caletas, about a mile and a half east of the town, and on the shore of the Mediterranean. I found butterflies in great abundance on

all the hills that fringe the coast east of Malaga; perhaps the best spot is reached by taking the electric tram towards the village of Palo, and getting off where the road crosses the bed of a torrent—dried up at this period of the year—about half a mile before Palo is reached, along the east side of this torrent, is a path leading to the foot-hills, which extend to within a few hundred yards of the coast; the highest of these eminences has an altitude of about 1500 ft., and is a prominent object from all points of view in the neighbourhood. Working up the small hills until you come to this mountain, and then traversing its lower slopes, keeping a little to the west of the main peak, you find butterflies in swarms. Most prominent perhaps in point of numbers was *Melanargia ines*, both sexes of which were in the finest condition, and my captures included a remarkable aberration with the under side of the right inferior clouded with black almost to its base. Closely following this species in point of numbers was *Anthocharis belemia* var. *glauce*. *Colias edusa* was also in great abundance, and I saw or captured about a dozen of the var. *helice*. Wherever there was an outcrop of calcareous rock *Thais rumina* was an abundant species, including some richly coloured examples; larvæ were also plentiful on *Aristolochia*. On the bushy slopes, flying slowly, were *Epinephele pasiphaë* and *E. ida* in profusion. On the summit of one of the lower slopes here I came across my first good specimen of *Papilio* var. *feisthamelii*, which I should say is a rare species in Andalusia; at any rate I did not see more than twenty examples altogether; with one exception they were found flying round the summits of isolated knolls, after the habit of *Papilio machaon*; two specimens only were netted at Malaga, and a third was seen. *Epinephele ianira* var. *hispulla* was well out, and in some numbers. Odd examples of *Pyrgus proto* were taken. Newly emerged *Gonopteryx cleopatra* were flying on May 4th. *Papilio machaon* flew here and there, the examples being very typical, and showing no approach to var. *aurantiaca*. A few each of *Lampides bætica*, *L. telicanus*, and *Nomiades melanops* were taken. On one occasion, in the hope of finding *Cupido lorquini*, I climbed to the top of the mountain, but did not observe it there, and only came across, in smaller numbers, the species found on the lower slopes.

May 7th found us training on to classic Granada.

Granada is situated at the foot of the Sierra Nevada, at a height of about 2200 ft.; outside the town, to the south and west, stretches the celebrated vega, a level plain irrigated throughout, and producing wonderful crops of corn, forage, and fruit. The Alhambra Palace and Fortress occupy the end of the aforesaid spur, which at its extremity is almost 500 ft. high, and occupies the angle between the rivers Darro and Genil. As the best, and practically only collecting-ground within easy walking distance

is this spur, it is best to stay at one of the pensions within the grounds of the Alhambra, or at the hotel 'Washington Irving,' just outside. The weather whilst we were at Granada was very fine, with practically cloudless skies, but, to us, abnormally hot for the time of the year, for several days the shade temperature running up to ninety degrees, though for the remainder of our stay it was normal—say seventy-five degrees.

(To be continued.)

A WEEK IN BROADLAND.

By C. E. RAVEN.

ONE of the greatest charms of insect-hunting is its uncertainty. If only we could pre-arrange the weather, our handbooks and lists of localities would be an accurate enough guide to rob the pursuit of its fascination. As it is, though one can be confident of success in some few cases, most of us have to look back upon night after night of cold dismal nothingness—a striking foil to the few "purple patches" of the lepidopterist's career.

It is such a purple patch that my week's holiday in the Norfolk Broads will always be.

We started, three of us, on August 1st, after a journey notable only for its abundance of infants and scarcity of porters, in a wherry from Wroxham. My friends were not entomological, and, though I had secured such information as I could from a kindred spirit who had worked a part of the district, I had brought few hopes of collecting and little apparatus—nothing more in fact than a couple of dozen boxes, a cyanide bottle, net and setting-case—the latter half full of captures taken or bred in the preceding week—and an acetylene cycle lamp, which has helped to catch many things.

On Saturday night (August 1st) we got down below Wroxham Bridge, and moored on the left bank alongside of a rough field. Here about six o'clock I found *Cænobia rufa* and *Scoparia pallida*, neither of them abundantly. As I had only once previously taken *C. rufa*—at Chatteris—I netted some half-dozen. After supper, about eight o'clock, we sculled down to the reedy thicket between the River Bure and Wroxham Broad. Here I landed, and though the herbage was almost over my head I managed to capture eight or ten *Lithosia griseola* and var. *stramineola*—the latter somewhat more common—and five *N. senex*. The few Wainscots seen were all worn *Leucania impura*. *Schœnobius mucronellus* and *Chilo phragmitellus* were the only other captures.

On the 2nd we sailed to Horning and down to the mouth of

the Ant. I looked longingly at the good land we were leaving; but my friends were eager to be at Barton regatta next day, and we passed through Ludham Bridge before mooring—in a hopeless locality which yielded nothing but a wonderful sunset over a land veiled in snowy drifts of mist.

An entomological friend had written saying that he had done well on the banks of Stalham Dyke: so to Stalham we went next day (August 3rd). Again we passed what looked ideal country, to moor in a poorer place. But on the left hand side of the dyke at its mouth there is a ragged piece of swamp, bordered with reeds and studded with a few alders and salallows. Here I landed and found the whole place alive with *C. rufa*. They were fluttering up the grass and rushes in thousands. The place was very wet, and about ten o'clock a thick white mist made further collecting useless. About nine o'clock, however, I had secured a single *Pelosia muscerda*, and besides had boxed all the Noctuæ I could not at once call *Leucania impura* or *L. pallens*. On examining these I found a fine typical *Helotropha leucostigma*, but of Wainscots there were only very abraded specimens of the two commonest species and *L. lithargyria*.

Up to this point the days had been cloudless and gloriously hot, the nights misty and decidedly cold. On Tuesday, August 4th, the weather looked like breaking: there was, as there had been, a good breeze: but the sky was overcast and there was thunder about. We moored at St. Benet's Abbey, just beyond the mouth of the Ant. On the right bank of the river the reeds had been cut to some distance from the water; but on working inland I found an isolated patch certainly not more than twenty yards by five, uncut, but of small reeds. I reached this at about 8.15, and netted a Noctua which whirled past me; on boxing it in a glass-topped pill-box, I saw that it was *L. brevilinea*. Several more followed; I lit my lamp, and as dusk came on the sight was wonderful. *Brevilinea* swarmed, flying low over the rushes. Standing still, I caught six in two sweeps of my net, as they hovered over some attraction—probably a newly hatched female. I soon filled the miserable two-dozen boxes, and was reduced to bottling them. Unfortunately my bottle was weak, and took some time to act. So I determined to return to the boat, empty my boxes and sally out again. I did so, and came out with as many as I had been able to empty, with an addition of empty match-boxes, small bottles and cigarette tins. By now, at ten o'clock, the first flight had quieted down, though many were still on the wing. I examined the salallow and alder to see if the insects resorted to them, as Mr. South in his 'Moths of the British Isles' reports. Probably there was an absence of honeydew—certainly there were no *brevilinea*. Among the reeds they were easy to see, sitting about half-way up on the flat blades; I noticed none at the reed-flowers, or at any other

blossoms—sitting thus, I secured three pairs, and filled my boxes, taking also a few very white *Tapinostola fulva*. This insect at first surprised me. Previously near Crowborough, in Sussex, I have taken only the red form and that in late September. Here I saw no red ones, though the insects were obviously fresh. The night, which had been good for moths, had been equally good for mosquitoes (I had been too busy to care for them), but after my second excursion I felt that enough had been done and suffered. I turned in, the proud possessor of forty-four *L. brevilinea*, five white *T. fulva*, and a typical *H. leucostigma*.

The next day I could hardly see or walk—the mosquitoes had feasted royally—and setting occupied much of my time. Wind and rain detained us at Potter Heigham Bridge, and the night was too stormy for nothing.

On August 6th we went down to Acle and then beat back to St. Benet's. The night was very windy; but I meant having another try at *brevilinea*. To my disgust I found my tiny reed-patch laid in swathes, and from its stubble I got nothing at all. There was a howling gale, but among the uncut beds I managed to net some dozen specimens during their dusk flight, under the lee of such bushes as there were. Then commenced the search. It is extraordinary how a small acetylene lamp brings out moths. I have not got a good eye for spotting them by day, but that night I fancy very few that came within the five-yard circle of my lamp escaped me. The reeds were waving furiously—boxing was no easy matter. But by leisurely searching between nine and ten o'clock I brought up my total for the night to twenty-five *brevilinea* and one *H. leucostigma* var. *fibrosa*. After that my eyes were so dazzled with the constant flicker of the reeds that I gave up the search—in fact I could not have seen a moth had one been sitting in front of me. Neither on August 6th nor on the 4th did I see any *P. muscerda*. *Lithosia* var. *stramineola* and a few common Geometers were all else that I noticed.

The next day we returned to Wroxham, having long journeyings before us for Saturday. I turned out at dusk to try the rough field opposite the mooring-place above the bridge, fell headlong through a screen of cut rushes into two feet of mud, and returned with nothing better than two *L. stramineola* and one *Noctua umbrosa*. Just as we were turning in a moth flew to our lamp and sat on the cabin wall. It was a last *L. brevilinea*, but whether an escape from the previous night's boxes or a genuine Wroxham specimen, I do not know. It was our farewell to Broadland.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 201.)

The under side hind wing, speaking generally, consists of five bands,* three lighter and two darker, all narrowly edged with black, but each of these bands has its own characteristics, which often help in determining the different species. The terminal light band consists of two parts, a narrow edging, bordered on each side, as in the fore wing, by a still narrower black line, and a row of light lunules, the edging being usually darker than the lunules. This band turns the corner, as it were, of the anal angle, and appears as a triangular light spot, the inner line of the border being sometimes absent. The outer dark band is also divided into two parts, consisting of a row of lunules and of the small irregular spaces between these and the black outer edging of the central light band. This latter again consists of two portions divided irregularly by a narrow dark line and broken up into spots by the nervures, the inner division, except in *deione* and *asteria*, being of a somewhat darker shade than the outer. The third and fourth spots of the outer portion, counting from the costa, stand out further from the base than the rest, conspicuously so except in *varia*, and to an exaggerated degree in *britomartis*. The inner dark band is much widened out in the centre, where it contains a spot of the colour (or of one of the shades) of the lighter bands. This we will refer to as the "light spot." The basal light band consists of five spots, of which the lowest, that on the inner margin, is frequently absent, the central one being the smallest (usually much the smallest), the diminution in size corresponding with the swelling in the centre of the inner dark band, the light spot in which has a tendency in all the species to break occasionally into the small central spot of the basal band. The actual base of the wing is again behind this band, and is cut up by the nervures into four spots, of which, as a rule, only the third (which is roughly triangular, the base resting on the fourth spot of the basal band) is at all conspicuous; sometimes, however, when the central spot of the basal band is unusually small, the second spot is easily distinguishable; the fourth, though much the largest and frequently invading the whole area of the fifth spot of the basal band, is inconspicuous, as it has the appearance, especially when this fifth spot is absent, of being a continuation along the inner margin of the inner dark band. The light bands will be referred to as the "terminal," "central," and "basal," the dark bands as the

* It is confusing to speak of either the dark or light bands as the ground colour as many authors do. If either be so, it must be the light part, as seen in the *didyma*-group.

"outer" and "inner." The fringes on both sides of both wings are yellowish white, chequered with black or blackish.

Beyond the passages already quoted there seems to be little help towards finding distinguishing marks between these species in the earlier lepidopterists. Ochsenheimer distinguishes *parthenie* from *athalia* by (1) its smaller size; (2) its longer wing-form and finer markings; (3) its later emergence, and absence from many of the localities of *athalia*. Like most, if not all, of his predecessors and contemporaries, he ignores the fact that it is double-brooded, and emerges before as well as after *athalia*. Berce, Bergstrasse, Boisduval, Borkhausen, Duponchel, Esper, Freyer, Godart, Herbst, Herrich-Schäffer, Hübner, Knoch, Latreille, Schiffermüller, Schneider, Wallengren, and others have been tried in vain; but Meyer-Dur's illustrations show that in his time (1851) the terms *athalia*, *parthenie*, and *aurelia* were used—in Switzerland, at any rate—in precisely the sense in which they are used to-day. Modern authors, too, are but of little assistance in this matter. Neither Frey nor Favre give descriptions; I have found nothing to elucidate the matter in Oberthür; and, turning to English authors, matters are even worse. Lang's descriptions are slight and his distinctions not reliable; Kirby's are somewhat fuller, but unfortunately are not consistent with facts; and even Kane is neither so clear nor so correct as one always expects to find him, a fact of which he himself makes full acknowledgment. A fairly exhaustive (and wholly exhausting) search through the entomological journals has revealed little but regrets and complaints at the difficulty of the group, the most valuable remarks in the English journals being contained in Kane's note in the 'Entomologist' for 1886, p. 145, on the instability of the species of this group, though I cannot concur in his theory as to the relationship of the plain and mountain forms, which, however, has strong advocates. To all this one grand exception stands out in the person of Rühl, who, in the 'Societas Entomologica,' has a monumental work on the subject, extending through six numbers in its fourth year and ten in its fifth. Of course he also deals at length with these species in his Palæarctic Butterflies, but for our present purpose his work in the 'Societas Entomologica' is the more valuable. This paper deals nominally with three species only—*athalia*, *parthenie*, and *aurelia*; but, as it includes *berisalensis* under the first, *varia* under the second, and *britomartis* under the last, we are left with only three forms—*asteria*, *dictynna*, and the typical *deione*—untouched, and these, generally speaking, the most easily distinguished. Parts of this paper I have embodied in the following descriptions of the various species, to much more I shall have to refer when speaking of the variation of the group; at present I must content myself with certain definite acknowledgments, and a few criticisms of the points on

which I cannot follow his lead. First, then, it was this paper which first drew my attention to the value of the shape of the second line (the inner subterminal) on the fore wings as a distinguishing mark. Secondly, Rühl's remarks on the shape of the lunules in the outer dark band on the under side hind wing of *aurelia* were most valuable to me, as confirming the opinion I had already formed on this subject. He compares them thus with those of *parthenie* (which are practically identical in shape with those of *athalia*):—"The second row of lunules—i. e. the inner one—in *parthenie* consists of clear highly-arched bows, which, with the exception of that nearest to the anal angle, exhibit a continuous band, even, large, and completely formed. This band is also present in *athalia* and *aurelia*, but in the latter the form of the arches is essentially different. Amongst all my *aurelias* I did not find one which had all the arches of this band fully developed as in *parthenie*. . . . The well-arched lunules of *parthenie* reach a maximum height of 2 mm., and are not less than 1 mm.; in *aurelia*, even in the female, they do not reach a maximum of more than 1 mm. Instead of the even, rounded half moons of *parthenie*, they appear in *aurelia* more or less levelled, and with the corners taken off." Whilst on this subject I may add that Birkman says that the markings on the under side hind wing of *aurelia* are fainter than those of *parthenie*; this Rühl says he fails to see, but it is certainly true of the female, at any rate. Perhaps my greatest debt to Rühl is in the matter of *britomartis*. His description first set me on the track of this species in the case of the Reazzino specimens, and it is to him that we owe the recovery of Assmann's example to the National Collection, as previously mentioned. To come to a few details: he quotes from Meyer-Dur, as a distinctive mark of the female *parthenie*, a light yellow spot near the apex of the fore wing; this, he says, also occurs sometimes in *athalia*, and even in *aurelia*. This is certainly the case, and I may add that its presence is by no means universal in the case of *parthenie*. He gives as a good distinction between the males of *athalia* and *dictynna* that in the former the aborted fore legs are long and strongly hirsute, in the latter short and ill-clothed. It must, indeed, be a rare case in which it is necessary to resort to this distinction. When he speaks of the resemblance between these two species he is apparently alluding to the shape of the markings, and is doubtless, in this case, correct; but the under side of the hind wing would at once dispel any doubt as between these two species. He says that the colour of the palpi, the hair of the under side of the body, and the colour of the aborted fore legs have all been taken as distinguishing features; but he distrusts them all. Yet he speaks of the palpi as being a good distinction between *athalia* on the one hand, and *aurelia* and *parthenie* on the other. Here I am quite unable to follow him,

as the palpi of *aurelia*, though they have their own distinctions, approach much nearer to *athalia* than to *parthenie*. He also states that *parthenie*, as a rule, has not less suffusion than *athalia*; but, taking the latter species from all its localities, in some of which the suffusion is slight, yet thirty per cent. would still be more heavily marked than *parthenie*, unless in the latter *varia* is included, an inclusion which would also throw light on the question of the palpi, those of *varia* approaching more closely to *aurelia* than to *parthenie*. His comparison of the markings from the base of the fore wings of *aurelia* outwards, on the under side, to the letters G, U, R is certainly fanciful—I have rarely been able to force my imagination into seeing the resemblance—and on his own showing it breaks down as a test, since it occurs also in *athalia* and *parthenie*. It cannot, however, be too strongly insisted upon that no single test will hold good every time, and that it is only by the multiplication of small tests that we can arrive in all cases at tolerable certainty as to the parentage of a given specimen. It is for this reason that I offer no apology for the frequent use of the words “generally,” “usually,” “often,” “sometimes,” &c., which will be found in the following descriptions with somewhat wearisome iteration.

We will now proceed to these individual descriptions, in which I have employed the terms previously explained, confining myself, by way of abbreviations, to the very intelligible “up. s., un. s.” for upper and under side, and “f.w., h.w.” for fore and hind wing.

DEIONE.*—Up. s. f. w.: Border sometimes divided, showing a line of the ground colour. All the black markings are generally narrow. The inner subterminal line is almost straight in its lower two-thirds. Elbowed line continuous, and generally not very much bowed inwards. Marginal blotch often reduced to two small V marks placed thus > <, often, however, joined by a black line, or even making a small italic *x* placed horizontally, sometimes, however, merely a black patch. Stigma more or less oval, and filled in with the ground colour, which is a bright lightish golden brown; basal lines distinct on both sides of the median nervure. In the female the upper lunules are generally, and the ground colour between the inner subterminal and elbowed lines frequently, conspicuously lighter than the rest of the ground colour.

Up. s. h. w.: Border rather broad. Black markings generally narrow, the inner line being the thickest, the outer often very fine. Extra line complete and generally double, the discal spot being often continued above, or below, or both, into a band or part of a band. Very little basal suffusion, the basal spot being therefore inconspicuous; it has often another single or double spot of the ground colour on its inner and a band of the same on its outer side.

* These remarks refer to the French specimens; the Spanish are often nearer to var. *berisalensis*.

Un. s. f. w. : The inner edging line of the border often forms part of a series of very flattened, narrow, black or brown triangular spots. Lunules very narrow and inconspicuous. All the black markings generally narrow. Outer subterminal line inconspicuous on account of its narrowness, but broadest near the anal angle; inner only conspicuous near the costa. Elbowed line generally represented by four costal spots (the uppermost being sometimes prolonged into a dash), though sometimes distinct throughout. Marginal blotch generally only a small black streak, though sometimes V, Y, or *x*-shaped. Stigma and basal lines faint.

Un. s. h. w. : Inner edging line of border generally slightly angulated, often brown, and sometimes very faint. Lunules of terminal band narrow and inconspicuous; orange lunules of outer band surrounded, except towards the outer margin, more or less broadly with lighter shade. Costal part rarely less distinct than the rest. Both parts of central band of the same shade. The light spot is roughly triangular, the point resting on the fourth spot of the basal band, the central spot of which is generally small in the male, and the fifth absent.

Var. BERISALENSIS.—Up. s. f. w. : Lunules small; two light costal spots between the two subterminal lines, the inner of which is almost straight in its lower two-thirds. Elbowed line not very thick, but continuous, and not much bowed inwards; marginal blotch shaped something like a small italic *x* placed sideways, thus *≈*, or a Y placed in the same manner and opening outwards. Stigma oval and filled in with ground colour, which is much darker than in the type. Basal lines distinct on both sides of the median nervure. In the female the upper lunules are generally, and the ground colour between the inner subterminal and elbowed lines occasionally, lighter than the rest of the wing.

Up. s. h. w. : Border very broad, often nearly filling in the lunules and joining the outer line. Inner line clearly defined and rather thick. Extra line complete and clearly defined on the outside, making two distinct rows of spots of the ground colour. Basal suffusion almost confined to the lower half of the wing, so that the basal spot is not conspicuous, and often has another single or double spot of the ground colour on its inner, and the upper half of a band of the same on its outer side. The discal spot occasionally coalesces with the extra line, but usually gives the appearance of a division of this line, making an "island" of the ground colour.

Un. s. f. w. : The inner edging line of the border forms a series of eight black lunules, of which the second, third, and sixth are the most, and the seventh and eighth the least conspicuous. Outer subterminal broadest and most conspicuous towards the anal angle; inner only conspicuous on the costa. Elbowed line represented by four costal spots, of which the uppermost is sometimes prolonged into a dash. Marginal blotch generally shaped like a Y placed horizontally. Stigma and basal lines generally faint.

Un. s. h. w. : Inner edging line of border carries a row of black lunules, sometimes very small, oftener large and conspicuous. The second and generally the first spots of the outer band are only slightly

less distinct than the rest. Both parts of the central band are of the same shade. The light spot is distinctly triangular, with its point resting on the fourth spot of the basal band. The central spot of this band is generally very small, and the fifth absent.

ATHALIA.—Up. s. f. w.: Exceedingly variable in the breadth of the black lines, but the subterminals are usually rather thick and much less clearly defined than in *deione*. The inner subterminal is bowed inwards and again outwards in its lower two-thirds. This is yet more markedly the case with the elbowed line. The marginal blotch is frequently large and thick, but occasionally almost wanting. The stigma is long and narrow, and usually more or less completely filled up with black. The basal lines are usually only conspicuous above the median nervure, and the space between them is often filled more or less with black. The basal suffusion is generally of considerable extent.

Up. s. h. w.: Most of the row of lunules are generally clearly defined; when otherwise, it is due to the encroachment of the outer line rather than the border. Breadth of black lines very variable. The extra line is frequently, and the discal spot sometimes, absent, or very slightly indicated; both are often included in the basal suffusion. The basal spot is more or less circular, generally very conspicuous, and most rarely invaded by the basal suffusion.

Un. s. f. w.: Lunules normally light, but sometimes almost of the ground colour except at the costa; the two lowest spots generally approach the ground colour; sometimes one or two, sometimes a whole row of lighter spots appear inside the outer subterminal line. The inner edging line of the border is generally arched between the nervures, but has not the black lunules of *berisalensis*. The outer subterminal line is very conspicuous at the anal angle, the inner is rarely indicated except by a few dots near the costa. The elbowed line is generally represented by three, sometimes by four, or even a whole row of spots, and by a very variable marginal blotch. The narrow stigma and upper half of basal lines are distinct.

Un. s. h. w.: Both edging lines of the border are more or less bowed between the nervures. The second and sometimes the first spot of the outer band are conspicuously less dark than the others. The inner part of the central band is always darker than the outer. The light spot is very variable in shape and size, but is rarely, if ever, of the shape of that of *deione*. The size of the central spot of the basal band is also very variable. The colour of the light bands varies in the male from silvery white to rich yellow, but in the female is always whitish.

PARTHENIE. — The fringes are rather longer and more conspicuously chequered than in *athalia*.

Up. s. f. w.: The border is sometimes divided into two very narrow dark lines, with the ground colour showing between them, as on the under side. The third lunule does not project noticeably towards the base. The inner subterminal line is sometimes only indicated, but when present, as is normally the case, it is further from the outer and nearer to the elbowed line than in any other species; it is nearly straight in its lower two-thirds.

The elbowed line, though often distinct and sometimes very broad, is occasionally only represented by its costal third, and runs into the inner subterminal; this I have never seen in *athalia*, though it occurs occasionally in *aurelia* and *britomartis*. The marginal blotch is generally small, sometimes absent. The stigma is broader than in *athalia*, circular, oval, or reniform, most rarely filled in with black, but occasionally reduced to a streak. The basal lines are fairly conspicuous above the median nervure, having often the appearance of a reniform stigma.

Up. s. h. w. : The border is sometimes divided as in the fore wing; the inner line usually further from the outer than in other species; when this appears not to be the case it is because the outer is unusually broad. Extra line and discal spot rarely indicated, except by a central portion of the former, which forms the outer edging of a spot attached to the exterior of the inconspicuous basal spot. Basal suffusion almost confined to the lower half of the wing, and sometimes wholly wanting. In the female, especially of the second brood, the ground colour of both wings often shows indications of the lighter and darker bands so conspicuous in the *aurinia* group.

Un. s. f. w. : Inner edge of the border scarcely arched. Most of the lunules generally pale, the upper ones always so, and the ground colour between the subterminal lines generally paler than the basal portion, with at least one pale spot near the costa. Outer subterminal scarcely, if at all, more conspicuous towards the anal angle; inner almost always visible, and often very clearly marked throughout its entire length. Elbowed line generally represented by three spots, but sometimes, especially in the second brood, traceable throughout. Marginal blotch small and pointing towards the apex. Stigma rarely well defined except in its lowest portion, and the basal lines do not extend beyond the median nervure. The basal dash often conspicuous in the male.

Un. s. h. w. : Both edging lines more or less arched, but the degree varies greatly. The two upper spots of the outer band, especially the second, are generally of more undecided pattern than the others. The inner division of the central band is darker than the outer. Inner band often ill-defined, though the light spot is generally small and narrow. The central spot of the basal band is also small. There is, generally speaking, less contrast between the bands than in the other species.

(To be continued.)

NOTES AND OBSERVATIONS.

GNOPHOS OBSCURATA VAR. MUNDATA.—I have always understood that the fine white variety, with all the markings obsolete, except the transverse lines and lunules, which Mr. Prout has named ab. *mundata*, was confined to the neighbourhood of Lewes, where it occurs rarely with the ordinary chalk form *argillacearia*. I was, however, informed last year that the form *calceata* (which is the name under

which *mundata* has been sent out for years, although Staudinger gives the ground colour of his *calceata* as pale gray, while *mundata* is pure white) had been taken at Folkestone, but I cannot get any confirmation of this. It would be very interesting to hear if *ab. mundata* does occur elsewhere, and if so, in what proportion to the chalk type (*argillacearia*).—A. J. WIGHTMAN; Ailsa Craig, Lewes.

LYCENA ARION PUPÆ.—Mr. Percy Richards, in a note dated July 24th, mentions that he found three other pupæ under one stone, and in exactly the same position as those previously reported (*antea*, p. 204); that is, in little earthen cells. He adds that only one butterfly emerged, and that this was slightly deformed.

LATE EMERGENCE OF AGRION PUELLA.—On my return from a week-end last Tuesday, I found that a female *Agrion puella* had emerged in the interim. I was away from August 15th to 18th. This date seems to be a very late one for emergence of this dragonfly.—HAROLD HODGE; Chapel Place Mansion, 322, Oxford Street, W.

THE APHIS-EATING CADDIS-FLY.—I have waited with considerable interest, not to say curiosity, for Mr. Arkle to respond to the invitation of Dr. Chapman to tell us the name of this aphis-eating caddis-fly, and to give us a description of its mouth-parts by which it performs this extraordinary feat; for it would be an extraordinary feat for a caddis-fly, as it is well known that the Trichoptera take no *solid* food in the adult state, their mandibles being obsolete. In some genera the proboscis is well developed, and may quite likely be used for sucking sweet fluids. The probability is that Mr. Arkle mistook a Neuropteran, or possibly one of the Mecoptera (Panospidæ), for a caddis-fly—most probably the former, as it is to this order that the aphis-lion belongs. This aphis-lion is the larva of *Chrysopa*; it destroys large quantities of aphides, and as the mouth-parts of the imago are free, with mandibles well developed, it is quite likely that they may also have a penchant for those enemies of the rose-grower.—CAMPBELL-TAYLOR; 7, Wellesley Road, Gt. Yarmouth, August 24th, 1908.

SPARROWS AS MOTH CATCHERS.—In view of the special interest which attaches to actual records of the observation of attacks on Lepidoptera by birds, I am induced to put together these few notes relating to a period covering some thirty-seven or thirty-eight years. In 1870 or 1871 the leopard moth was extremely common on the tree-trunks in the squares and parks of London. My mother, who was always keenly interested in collecting for me, boxed numerous specimens from Gordon, Euston, and other squares. She reported more than once that she had seen detached wings of the moth lying on the ground at the foot of the trees, but had never been able to ascertain what had attacked the insect. This observation was published by me about the date mentioned, with the conjecture that the enemy would most probably be found to be the sparrow. This has since been confirmed by my cousin, Mr. J. A. Finzi, who informs me that he has repeatedly seen the sparrow at work in Regent's Park,

the birds actually climbing the trunk and devouring the body of the moth while the wings were allowed to fall to the ground. So far as concerns the sparrow, it is evident that *Z. asculi* is not a "protected" species, although the type of pattern and the leathery texture of the wings of this moth would suggest that, as regards insect foes as a whole, it enjoys more or less immunity from attack. The latest observation is due to my colleague, Professor E. G. Coker, who informed me last spring that, sitting in his study at Chingford, he heard one morning a fluttering on the window, and a greater commotion outside. Thinking a moth was in the room, and wishing to secure the specimen for me, he went to the window and found a moth flying up and down on the window-pane between the glass and the inside blind, which was drawn down at the time. The commotion outside was caused by sparrows, a number of which were flying at the window, and trying to get at the moth protected from them by the glass. Prof. Coker boxed the moth and brought it to me, and it proved to be *Plusia gamma*. Had the moth been outside the window instead of within its fate can be imagined.—R. MELDOLA; Craig View, Portpatrick, Galloway, N.B., August 21st, 1908.

GYNANDROUS AGROTIS PUTA.—It may interest some of your readers to record that I took a singularly perfect gynandromorphous specimen of *Agrotis puta* at sugar on the Deal sandhills last night—left side male, right side female. The antennæ correspond with the wings, that on the left side being pectinated as in the normal male. From a superficial examination with an ordinary hand-lens, I should say that the genitalia of both sexes are present. The anal extremity presents a curious appearance, as there is a distinct trace of the male anal tuft on the left side, while the female ovipositor protrudes to the right. The female side is very dark, and this gives the insect a striking appearance, contrasting very strongly with the light male side.—P. A. CARDEW (Capt. R.A.); St. Aldwyns, Park Avenue, Dover, August 25th, 1908.

THE ENTOMOLOGICAL CLUB.—A meeting was held, on May 12th, 1908, at Stanhope, The Crescent, Croydon, Mr. T. W. Hall, F.E.S., in the chair. Mr. H. Rowland-Brown, M.A., F.E.S., nominated at the previous meeting, was elected a member of the Club.

CAPTURES AND FIELD REPORTS.

COLIAS HYALE IN SOUTH DEVON.—On August 4th I saw a specimen of *C. hyale* on the coast near Dawlish.—(Rev.) J. E. TARBAT; Fareham, Hants.

COLIAS EDUSA IN ESSEX.—On August 7th I saw about a dozen *Colias edusa* flying over lucerne fields at Wallasea, Essex. I captured one male, and one female which has the marginal spots almost absent. She laid a few ova on the 9th, but none during the following week, although fine sunny weather continued; but on the 16th she again

laid about three dozen, and about six dozen on the 17th; the two following days being sunless she has not moved.—F. W. FROHAWK August 19th, 1908.

COLIAS EDUSA IN SURREY.—I captured a fine male specimen at Box Hill on August 8th last.—R. SOUTH.

COLIAS EDUSA, &c., AT SWANAGE.—At Kingston (four miles from here) *Colias edusa* seems fairly plentiful this year; after fifteen minutes' sprinting, two weeks back, I secured a splendid specimen, but the others evaded me, and I find that if you miss once, they don't give one a chance for a second shot. Took two specimens of *Smerinthus populi*, which came to light; this is the first time I have seen this insect here. *Pyrameis cardui* is in abundance here this year, as also are *Vanessa atalanta* and *Argynnis aglaia*.—LEONARD TATCHELL; Karenza, King's Road, Swanage, August 27th, 1908.

COLIAS EDUSA IN SUSSEX.—As this insect has not been common in this neighbourhood for some years, I thought it might be interesting to record that about twenty specimens have been taken by myself and friends this season, of which the first was obtained on July 15th last. Surely rather an unusual date for this species?—GUY E. H. PESKETT; Simla, Preston, Brighton, August 25th, 1908.

I noticed on Monday, August 3rd, on the Willingdon Golf Links, near Eastbourne, a male *Colias edusa*. It was flying low, and seemed to be in perfect condition.—HAROLD HODGE; Chapel Place Mansion, 322, Oxford Street, W., August 20th, 1908.

This has not been what might be termed a "*Colias* year," but I found *Colias edusa* more plentiful this year on the Sussex Downs than either last year or the year before. August 16th and 17th were brilliant days, and the collecting-ground chosen was a sheltered hill-side facing south, where the full heat of the sun could be felt, and with a clover field in immediate proximity. On August 16th I netted six specimens between 1 p.m. and 2.30 p.m., and on August 17th I added four more specimens, taken between 11 a.m. and 12.30 p.m. Of the ten specimens, eight were males and two females, and they appear all to be newly emerged, but three are slightly chipped. Perhaps other readers will be good enough to relate their this year's experience with *Colias edusa*.—R. T. BAUMANN; "Normanhurst," Chingford, Essex, August 27th, 1908.

COLIAS EDUSA NEAR NORWICH.—To-day, whilst out collecting, I saw a specimen of *C. edusa* flying along a field which had just been cleared of wheat.—R. LADDIMAN; 25, Drayton Road, Norwich, August 26th, 1908.

ACHERONTIA ATROPOS IN NORFOLK.—Whilst at Ranworth on the 20th of this month I had the good fortune to obtain a larva of *A. atropos*, which had been dug up in a potato field. This changed to a fine pupa on the 26th.—R. LADDIMAN.

ACHERONTIA ATROPOS IN KENT.—I have heard of several larvæ of this species in the Isle of Sheppy, and an imago was taken last week on board the battleship 'Magnificent' off Margate.—J. J. JACOBS; Gillingham, Kent, August 15th, 1908.

PLUSIA MONETA IN THE PETERBOROUGH DISTRICT.—In answer to Mr. G. T. Nichol's query, it may interest him to know that on July 29th, 1904, I captured one specimen of *P. moneta* at light at Uppingham, Rutland. In North Cambridgeshire Mr. J. C. F. Fryer, of Chatteris, has never found it, but on July 27th of this year I took a specimen at Little Shelford, and I believe the species has been previously recorded not infrequently in South Cambridgeshire.—C. E. RAVEN; 7, Durham Terrace, London, W.

PLUSIA MONETA IN NORTHAMPTONSHIRE.—Referring to Mr. G. T. Nichols's note in the August 'Entomologist' on the occurrence of *Plusia moneta* in Peterborough, it may interest your readers to know that the species was fairly common this year in my garden, where I secured both larvæ and imagines. The cocoons were also fairly numerous this year in the garden at Tring Park.—N. CHARLES ROTHSCHILD; Ashton Wold, Oundle, Northants, August 11th, 1908.

SENTA MARITIMA, &c., IN SUSSEX.—In reference to Mr. Wightman's note in the August 'Entomologist,' I should like to say that I captured two fine specimens of *S. maritima* in a small reed-bed near Rye on August 3rd, 1907, and noted their capture in the Annual Report of the Hastings and St. Leonards Natural History Society. The species had not been previously recorded from the district. From the same reed-bed—some ten yards wide and forty yards long, and quite isolated—I have also taken *L. straminea*, *C. phragmitidis*, and *N. geminipuncta*.—C. E. RAVEN; 7, Durham Terrace, London, W.

COSMIA PYRALINA AT CHESTER.—On the night of August 3rd I captured, at one of the Chester electric lamps, a fine fresh specimen of *Cosmia pyralina*. This is the second record of the moth for the district, and it is curious that I should have been favoured with the first just twenty years ago (see Entom. vol. xxi. p. 318).—J. ARKLE; Chester.

CALAMIA PHRAGMITIDIS IN SUSSEX.—I find that this species has not been previously recorded as occurring in Sussex. It may be of interest therefore to say that it was found by Messrs. Jarvis, Sharp, and myself to be quite plentiful in the valley of the Cuckmere and on the Pevensey Marshes, while a few specimens were taken on the Ouse near Barcombe.—A. J. WIGHTMAN; Ailsa Craig, Lewes.

AMPHIDASYS BETULARIA VAR. DOUBLEDAYARIA IN RUTLAND.—Those of your readers who study the distribution of this melanic form in Britain will be interested to hear that this summer I took a female in this truly rural district of Rutland. I also bred a specimen last May from a larva found on black poplar the previous September. So far I have not come across the type.—HAROLD RAYNOR; Stoke Dry Rectory, Uppingham, August 13th, 1908.

DICYCLA OO IN RICHMOND PARK, SURREY.—I took two fine specimens of *D. oo* in the park on July 11th, and saw two more examples, which I failed to capture. I understand that others have also obtained this species in the same locality. I may add that, with the exception of one specimen at light four years ago, *D. oo* has not been

met with by myself in this neighbourhood since 1896. — PERCY RICHARDS ; 11, Queen's Road, Kingston Hill.

COUNTY CORRECTIONS. — There are two records in the August 'Entomologist' from Bournemouth, neither of which are geographically correct, viz. *Hyloicus pinastri*, by Mr. Reynolds, at Branksome Park, Bournemouth, and *Deilephila euphorbiæ*, by Mr. W. G. Hooker, at Canford Cliffs, Bournemouth. Bournemouth is in Hants, whilst Branksome Park and Canford Cliffs are both in Poole, and geographically in Dorset; the capture of the *D. euphorbiæ* having taken place at least one and a half miles inside the Dorset border. — W. PARKINSON CURTIS; Aysgarth, Poole, August 12th, 1908.

RECENT LITERATURE.

Transactions of the City of London Entomological and Natural History Society for the year 1907. Published by the Society at the London Institution, Finsbury Circus, E.C.

As we have noted in previous years when referring to this publication, the items appearing under "Reports of Meetings" (pp. 4-12) are interesting and instructive. The papers comprised in the volume, four in number, will be found most helpful to all who are in any way studying the subjects upon which they respectively treat. "The Variation of *Entephria cæsiata*" (pp. 21-32), by Mr. Prout, is exceedingly valuable. Dr. Hodgson, in "Notes on *A. bellargus*, with references to Allied Species" (pp. 42-47), presents some interesting statistics. "Notes on the Wainscots" (pp. 32-40), by Mr. Edelsten, deals chiefly with the life-history of some of the fen species in the group. Accompanying Mr. Cockayne's "Notes from North Sutherland" (pp. 33-39) is a plate of photos of some varieties of moths he obtained in that remote corner of Scotland. In the Presidential Address, Mr. Mera remarks, among other matters, upon the varying effect of cold and dull weather on Lepidoptera reared in confinement.

The Senses of Insects. By AUGUSTE FOREL. Translated by MACLEOD YEARSLEY, F.R.C.S. Pp. i-xvi and 1-324. With two Plates. London: Methuen & Co.

THOSE who have been unable to acquire or to study Forel's admirable work in the original will be grateful to the translator and publisher for the opportunity of adding this inexpensive and handy volume to their library. The subject-matter, originally published in five parts, at intervals of time, is here arranged in twelve chapters, in the eleventh of which is included experiments made by Dr. Forel on memory of time and association of memories in Bees ('Comptes rendus de l'Association Française pour l'avancement des Sciences; Congrès de Lyon,' 1906).



1



2

1. *ABRAXAS GROSSULARIATA*.
2. *A. sylvata* (*ULMATA*) var.
(W. J. Lucas photo)



4

4. Ova ($\times 20$).



3

RAPHIDIA NOTATA AND ITS OVA.

3. Imago ♀ (nat. size).

G. T. Lyle photo.

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[No. 545

OVA OF *RAPHIDIA NOTATA* (NEUROPTERA).

BY G. T. LYLE.

(PLATE VII.)

IN the summer of 1907 I found a female of this, the largest of the four British species of the Raphidiidæ (snake-flies), one of the families of the Planipennia. The insect was crawling on the trunk of a tree (*Pinus sylvestris*) in Perry Wood, in the New Forest. I placed the specimen in a pill-box, and took it home with the intention of photographing it. On opening the box the next day I discovered that it had deposited six eggs in the crevice between the box and the lid, thus leading one to suppose that they are normally laid in the chinks of the bark. The eggs were conical in shape, and had a very short pedestal at the thicker end. They stood erect on this, and were in contact one with another, as is the case with the eggs of *Sialis lutaria* (the alder-fly). They were white in colour, and were covered with faint reticulations. The photograph of the imago is natural size; that of the ova is magnified twenty diameters.

Brockenhurst.

JOTTINGS ON APHIDES TAKEN DURING 1907 AND 1908.

BY CLAUDE MORLEY, F.E.S., &c.

(Concluded from p. 212.)

THE genus *Aphis* is a long one, and many of its species are common. *A. brassicae*, Linn., was forming large powdery masses on the flowers of *Brassica oleracea* on June 9th, and is still abundant there; but I have seen no winged forms. At the same time last year I found a little cluster of four apterous *A. crataegi*, Kalt., on a leaf of *Crataegus oxyacantha* in Framlingham Castle moat,

and on the same leaf a winged specimen, which however must, I think, be referred to *A. pruni*. On the same plant at Bedford, early in August, *A. edentula*, Buck., was fairly common in all its forms on the terminal shoots. About one hundred *A. subterranea*, Walk., were found on the root of a carrot on August 24th; the root was distorted by them just below the surface. No winged forms were seen. Mallow has failed to produce *A. malvæ*, Fabr., but it occurred last year abundantly in my garden below the flower-heads of *Achillea millefolium* early in August, and among them was walking a remarkable black female Chalcid with flavous antennæ and hind femora, contrasting strangely with dark tibiæ; its entire length is $\frac{3}{4}$ mm. On June 1st, 1907, winged *A. mali*, Fabr., were somewhat common, with a few evacuated pupal skins, sitting on the under side of fully grown leaves of *Pyrus malus*, and on the 3rd the apterous females and larvæ were found to be abundant in their curled apple-leaves, which they discolour; larvæ of *Syrphus ribesii* (which I bred), and, later, of *Coccinella bipunctata*, appeared to have entirely demolished the whole of this species by the end of July. *A. urtica*, Kalt., was abundant in all its forms on stems of *Urtica dioica* on June 2nd, and what appears to be the same species occurred commonly on the new shoots of *Rubus fruticosus*, though only two winged specimens were seen on the latter food-plant. In rolled leaves of *Prunus spinosa*, *A. pruni*, De G., occurred commonly early in June, with a proportion of one winged to every score of apterous females. *A. atriplicis* was abundant in the salt-marshes at Southwold last September on *Statice limonium* and *Aster tripolium*. *A. hieracii* (sic), Kalt., was last year first seen very rarely on leaves of *Heracleum sphondylium* on June 9th; by the middle of July it was common, and at the beginning of August excessively abundant in all its stages on the stems, just below the flower, of hogweed; on July 26th, 1904, I observed a specimen of *Bassus nemoralis* investigating a brood of this Aphid in Ipswich; it walked over the flowers without being attracted by them, and closely investigated the Aphids, but did not attack them in any way;* I am able to assert that *Stigmus solskyi* certainly preys upon this Aphid, since I have seen this Fossor attack them upon the stem of a seedling plant in Ipswich on July 28th and 29th (cf. Saunders, 'Aculeata,' p. 90; Prof. Poulton tells me he has further confirmation of the fact). A single plant of *Epilobium hirsutum*, among many, produced a dozen larvæ and one of both forms of the female of *A. epilobii*, Kalt., in the middle of August. *A. hederæ*, Kalt., first called my attention to this group of insects by crowding the shoots of *Hedera helix* cluster-

* We have yet much to learn concerning the parasitism of the *Schizodontes* upon aphidivorous Syrphid flies, for which no doubt both this specimen and the *Bassus tarsatorius* mentioned above searched among the Aphids (cf. Trans. Ent. Soc. Lond. 1905, pp. 419-438).

ing round the house-windows ; it is quite indifferent to light, and attacks with equal voracity sickly ivy-shoots in dark places ; *Lasius niger* is much attracted by it. Local guelder rose appears exempt from *A. viburni*, Schr., which was abundant on *V. opulus* in Mr. Morey's garden at Newport, Isle of Wight, at the end of June, 1907. *A. rumicis*, Linn., is one of our commonest kinds here, and bewilderingly omnivorous ; I first took the winged form singly in only half-uncurled apical leaves of *Rumex acetosa* ; all its forms were a pest to broad beans throughout last summer, and flew abundantly into one's eyes during the flowering season. Early in August it was common on *Cnicus arvensis*, formed black masses on some of the stalks of *Petasites officinalis*, swarmed on beet-plants, and a few females and pupæ occurred on *Hieracium* ; I also took it at Norton Wood, Isle of Wight, on June 20th, and received it from Fulham (London) in September. Thirteen of the distinct larvæ of *A. papaveris*, Fabr., were clustered together on the under side of a leaf of *Papaver rhæas* on July 30th, 1907, and three winged forms found on the same plant on June 8th may be identical. All the forms of *A. pyri*, Fonsc., were abundant in the curled leaves of *Pyrus communis* early in June. I have been quite unable to discover the common *A. jacobææ*, Schr., *A. laburni*, Kalt., and *A. sambuci*, Linn., upon their respective food-plants, though diligently searched ; nor have I detected any of the half-dozen *Hyalopteri*, except *H. arundinis*, which was so abundant on all the reeds in salt-marshes about Southwold as to render the sweep-net quite heavy ; among them I detected *Coccinella 11-punctata* and great numbers of *Bassus lætatorius*, both apparently ovipositing.

At the end of May *Chaitophorus aceris*, Linn., is abundant beneath the leaves of *Acer campestre*, in all its forms, mingling later with *Drepanosiphum*. Buckton says the alate *C. salicivorus*, Walk., is unknown in Britain, but on August 2nd last I succeeded in securing three examples of it among myriads of the apterous form scattered all over the under side of leaves of *Salix caprea* ; one of the winged specimens was dead when found, though not parasitized. The common form was also seen at Southwold in September. In the middle of August *C. leucomelas*, Koch, is not uncommon in its curious flavous dome-shaped blisters both on the upper and lower sides of the leaves of *Populus tremula* at Monks Soham and Easton Park. The winged form of *Callipterus betulicola*, Kalt., was excessively abundant on small birch-bushes in Tuddenham Fen, Suffolk, on May 6th. *C. coryli*, Goet., occurred commonly, though singly and sparsely scattered over the under side of hazel-leaves here early in last August ; the apterous form was then much the rarer. Two winged females and four pupæ only had been previously taken on June 4th. It was also common at Easton Park in the middle of August, together with *C. quercus*, which I first found on oak-

leaves in my garden on June 4th, 1907, since which time it has been common singly, but much scarcer in the apterous condition. On August 27th, 1906, I swept the distinct *C. castaneæ*, Buck., from rough heath-grass in Tuddenham Fen; it was quite common there, and I brought home seven winged and nine apterous females. On the under side of (usually young) leaves of *Alnus glutinosus* near Easton Park, on August 17th last, winged *Pterocallis alni*, Fabr., were not rare, though only one apterous imago and but few larvæ were seen.* *P. tilie*, Linn., I have twice captured flying in July in Suffolk, at Ipswich and Kessingland. Here the winged form is solitarily abundant on the under side leaves of *Tilia platyphyllos*; comparatively few appear to be "stung," and all the apterous forms are very scarce. The only *P. juglandicola* I have met with was on the leaf of a walnut-tree at Sibton Abbey, Suffolk, last September. *Phyllaphis fagi*, Linn., was in both years abundant in all its forms beneath the leaves of both old and young *Fagus sylvatica* at the beginning of June; in late July I could find none, though I had noticed no foes of any kind.

It appears conjectural whether the Lachnides group of the Aphidinae should include the two last-named genera, as ranged by Buckton, since the apical antennal joint is almost identical in *Callipterus*, and the elongate legs of *Lachnus* are not represented. Of this genus, the presumably rare *L. agilis*, Kalt., is commonly beaten from *Pinus sylvestris* in the middle of August here, though but three winged forms have been seen. Many winged *L. macrocephalus*, Buck., were beaten from *Picea excelsa* at Foxhall, near Ipswich, on July 4th, 1904; and Kirby and Spence say (Introd. 7th ed. p. 185) that *L. pini*, Linn., used to be common in Mr. Sheppard's garden (he was curate at Naeton in the same neighbourhood, 1804-7). I have captured winged *L. pinicolus*, Kalt., in Bentley Woods, July 26th, 1897, and Easton Broad, Suffolk, June 3rd, 1905; at Wilverley, in the New Forest, and Parkhurst Forest, Isle of Wight, in June, 1907; and in the middle of August I have beaten the apterous form abundantly from Scotch fir in my garden, where were no winged individuals. Three hibernating females of *L. viminalis*, Fonsc., were found beneath the bark of *Salix alba* by the Gipping at Ipswich during the winter of 1894-5. Kirby says (Introd. 7th ed. p. 336) that he has taken *Trama troglodytes*, Heyd. = *Aphis radicum*, in the nest of *Lasius flavus*—most probably at Barham. What I believe to be the undescribed (by Buckton) winged female of *Dryobius*

* Buckton did not describe from living specimens. When alive winged *P. alni* are pale yellow, with the apex of the scutellum and two indeterminate transverse abdominal bands distinctly green; the nectaries are entirely, and the tarsi apically, black; the stigma of the wing is transparent, with its base and apex clouded; and the basal transverse nervure of the upper wing is much darker and more conspicuous than the remaining veins.

roboris, Linn., was swept by Mr. Elliott and me in Parkhurst Forest and the Haven Street Woods, in the Isle of Wight, in June, beneath oaks in 1907; it is a beautiful insect, with black wings bearing an interrupted oblique apical line, a central band extending transversely across the disc, and the whole basal area, transparent; the apterous form occurred with it.

Of the Schizoneurinae, *Schizoneura lanigera*, Hausm., is only too common here and at Brandon, in North-west Suffolk, on the bark of *Pyrus malus*; I have, however, seen none winged. Apterous *S. fuliginosa*, Buck., are equally abundant in downy masses, one behind the other, on the pinnules of *Pinus sylvestris*, last August; the earliest winged ones were seen on the 22nd. At the end of June, 1907, I took *S. ulmi*, Linn., in all its forms in rolled and blighted leaves of elm in Mr. Morey's paddock at Newport, Isle of Wight, though a diligent search has failed to reveal it here. Perhaps the ubiquitous *S. corni*, Fabr., was the species said by Kirby to have occurred in incredible numbers in Ipswich in 1814; it is, at all events, often abundant there at Wherstead (October 29th, 1903), and Barren Heath (September 15th, 1904); the first one last year was noticed on August 22nd, and it occurred at Reydon, Suffolk, in September. I have seen no apterous forms, nor have I observed it upon *Cornus sanguinea*. I hope to do more with the three remaining small subfamilies anon. At present I can only mention *Chermes laricis*, Htg., of which I found eggs, larvæ, and winged females abundantly on young *Pinus larix*, together with a large dead oviparous female and a Coccinellid larva, at Foxhall Plateau at the end of May, 1907; it also is common on old larches in my garden here. Of the rest, I believe that the apterous pale Aphid taken by Mr. Chitty and me at Brandon, in the nest of *Tetramorium cæspitum* early in May last year, is *Forda formicaria*, Heyd.

Monks Soham House, Suffolk: August 1st, 1908.

DESCRIPTIONS OF TWO SPECIES OF EVANIA FROM BORNEO.

By P. CAMERON.

Evania kuchingensis, sp. nov.

Entirely black; the wings almost hyaline, the nervures black, the head, pro- and mesothorax covered with silvery pubescence. Face closely, finely, distinctly punctured, the front and vertex shining, finely punctured, but not so closely as the face; there is a shallow furrow outside the raised inner orbits. Eyes with a distinct greenish colour, very slightly converging above; the malar space long, half their length. Ocelli in a curve, the hinder separated from each other

by a distinctly greater distance than they are from the eyes. Palpi black. Scape and pedicle of antennæ as long as the fourth joint, which is about one-fourth shorter than the third. Prothorax finely, closely punctured, the lower half of the propleuræ irregularly striated, the striæ almost forming reticulation. Middle lobe of mesonotum irregularly, somewhat strongly punctured, the punctures clearly separated and more numerous on the sides than on the centre; the lateral lobes very minutely punctured, the base on the outer side with two outer and four inner foveæ, the apical half along the sides furrowed. Scutellum, except in the centre, more strongly and closely punctured than the mesonotum. Upper basal half of mesopleuræ smooth; the rest with round clearly separated punctures; the apex with a row of oblique stout striæ. Metathorax closely reticulated. Hind tibiæ and tarsi finely spinose; the long spur of hind tibiæ about one-fourth of the length of metatarsus. Metasternal forks strongly diverging, longish, stout. Apex of claws cleft; the lower branch thicker than upper. ♂. Length, 7 mm.

Kuching, Borneo (John Hewitt).

The coxæ and trochanters are covered with a silvery pile. The recurrent nervure is received beyond the transverse cubital. Abdominal petiole smooth and shining, the sides pubescent; the rest of the abdomen very smooth, bare, and shining.

Evania Hewittii, sp. nov.

Black; the antennal scape and the basal joints of the flagellum below and the fore tibiæ testaceous, the wings hyaline, the nervures black, the face and malar space somewhat strongly, closely striated, metasternal fork stout, straight, obliquely diverging; hinder tibiæ not spined; the long spur of the hinder tibiæ about one-fourth of the length of the metatarsus. Abdominal petiole in the middle closely but not strongly striated. ♂. Length, 3.5 mm.

Quop, October (John Hewitt).

Apex of mandibles rufo-testaceous, the palpi testaceous, third antennal joint as long as the scape and as long as the fourth. Temples smooth and shining. Malar space about two-thirds of the length of the eyes. Mesonotum sparsely, the scutellum more closely and strongly punctured. Metanotum at the base with round, moderately deep punctures, and moderately close together; the rest of the metathorax closely reticulated, except for a smooth triangular space below the wings. Mesopleuræ smooth and shining above, the lower part slightly dilated and sparsely punctured. Abdominal petiole two-thirds of the length of the rest of the abdomen. Radial cellule wide, the apical and basal abscissæ of the radius curved; the transverse basal and the recurrent nervures interstitial. The sides of the front are striated, its centre and the vertex smooth. Hinder ocelli separated from each other by a distinctly greater distance than they are from the eyes. Parapsidal furrows deep, curved. Head and thorax sparsely covered with short white pubescence, as are also the legs. Hinder coxæ smooth, depressed and shining at the base, the rest opaque, somewhat strongly, irregularly punctured.

NOTES ON SOME ANDALUSIAN BUTTERFLIES.

BY W. G. SHELDON, F.E.S.

(Concluded from p. 218.)

THERE are several walks one can take on the Alhambra hill that afford good collecting; perhaps the best is reached by proceeding along the road past the 'Washington Irving' as far as the cemetery; skirting round this, taking the left-hand side, until you come to the far end, then taking a diagonal course down the slopes towards the river Genil until you get to the upper edge of the cultivated ground, and then walk up its valley for a mile or more, at the junction of the cultivated with the uncultivated ground. Another good locality is reached by taking the road to the left, about half-way between the 'Washington Irving' and the cemetery, and following it for some two miles until you come to a plateau overlooking the gorge of the Darro; no one should miss reaching this spot for the sake of the view alone, which is truly superb: the plateau, which is thickly overgrown with *Cistus*, *Ilex*, *Cytisus*, *Dorycnium*, and other kindred plants, extends for several miles, the whole of which is very good ground. This plateau can also be reached by taking the road last described and diverging from it a few hundred yards after you enter it from the 'Washington Irving' road, at the first gorge that passes alongside it on the left. By crossing this gorge, and bearing up the hillside at the back of the Generalife Gardens and Palace, you come to the ridge of the Darro gorge, and by following this until you get to the plateau you find not infrequently *Papilio* var. *feisthamelii*, the only locality I could meet with it at Granada.

The morning of May 8th broke fine and cloudless, and when I reached the far end of the cemetery, soon after 8 o'clock, I was evidently not too early, for things were flying briskly. As I dropped down the slope *Polyommatus baton* var. *panoptes* was the first insect netted; it was in numbers and good condition. Swift-winged *Colias edusa* and the whites flew wildly to and fro; one did not stand much chance on these slopes of catching any! *Chrysophanus phlæas*, evidently reared under cold conditions, and showing no approach to ab. *eleus*, was in swarms. *Melanargia ines* again, not in such numbers as at Malaga, but in the pink of condition, took up my time till after 9 o'clock, but to my surprise there were no signs of *Zegris eupheme* var. *meridionalis*, which was the chief entomological reason for my visit to Granada, and which I had been led to expect on these slopes. I decided therefore to move on further up the Genil valley; in doing so I crossed several small ravines, down the bottom of which in winter evidently ran a stream; in these the fine Spanish form of *Melitæa deione* was in some

numbers, the females measuring over 50 mm. across the wings ; with them were *M. phæbe* var. *occitanica*, easily recognized on the wing by its more powerful flight. Eventually, coming in my direction, I saw, about 10 o'clock, a yellowish white butterfly, which I knew could only be the much-desired Granada speciality ; this I managed to net, but to my great disappointment it was worn to rags. Mr. Tylecote had found *Z. var. meridionalis* just coming out at the end of April, 1904, and yet only ten days' later in the year I now found that I was too late for it at its best. However, having found one specimen I soon came across more, and by noon had netted seventeen, of which only nine were cabinet specimens. The next day I tried the Genil valley again, taking much the same species as on my first visit, and netting sixteen *Z. var. meridionalis*, of which only seven were of any use. May 10th I tried higher ground on the way to the before-mentioned plateau, and here I found a spot which contained some good *Z. var. meridionalis* and captured ten good specimens. On the 11th I again visited this spot, but only obtained three, and, except for single females on the 13th and 15th May, I did not again see the species. It seems evident, from my experience, that the best time at Granada for this elusive insect is the first week in May, and that it is only a very short time on the wing.

Z. var. meridionalis at Granada chiefly haunts patches that have not been cultivated for a year or so, thus allowing a luxuriant growth of a yellow crucifer which is very like *Sinapis arvensis*. I saw females depositing ova on this plant, and fed a larva on it for several days until I left Granada. After this I found it would eat the flowers of any yellow crucifer I could find. This larva survived until it reached the third stage, and was then light pea-green in colour with a black head, and the segments thickly covered with small black spots. The ovum is of the usual Pierid shape ; when first deposited amongst the flower-buds of its food-plant it is light green, changing in a day or so to orange.

The males have a swift steady flight, and are not particularly difficult to capture. They are easily distinguished from the numerous Pierids amongst which they fly by their yellowish tint ; the females, which fly much more slowly, in consequence of the less amount of yellow are much more difficult to distinguish.

On the first occasion I visited the plateau overlooking the Darro gorge I found, on the way up, in addition to *Z. var. meridionalis*, *Pyrgus sao* frequently, apparently the Central European form, and showing no approach to the var. *therapne*, which is said to be the form occurring in Andalusia, and which I had taken in Corsica in 1906. In the small gorge to the left of the road *Euchloë euphonides* was abundant and in fine condition. The Andalusian *E. euphonides* interested me greatly ;

it will be remembered that, until lately, *E. euphonides* was considered to be a form of *E. eupheno*, the nearly allied species found on the African side of the Mediterranean. Considering that the known distribution of *E. euphonides* is, according to Staudinger, Spain and Portugal, Southern France and Italy, and that *E. eupheno* occurs all along the African shores of the Mediterranean, it would seem a fair inference that either Africa received its species from across the Straits of Gibraltar, or *vice versa*; and, bearing in mind the similar climate on both sides of the Straits, that the form found in Andalusia would be intermediate between those occurring in France and Morocco. This is, however, not the case. I cannot see in any Andalusian examples collected at Algeciras, Ronda, and Granada, the slightest tendency towards *E. eupheno*; the males are practically identical with my French specimens; the females, however, differ considerably, but not in the direction of *E. eupheno*. The French females have the tips of the superiors of a brilliant orange colour, through which the greyish black suffusion of the veins shows prominently. In the Andalusian females this orange is much less pronounced in quantity and brightness, and in one of my specimens it is almost entirely absent, consequently the suffused veins show up much more and give the impression of a grey tip.

The Andalusian seems also a much smaller insect than the French, my largest examples measuring only 41 mm., whereas some of those from France exceed 48 mm. in expanse.

Another insect that did not turn out in accordance with my anticipations was *Aglais urticae*; I had observed one or two specimens a few years ago in Arragon, which appeared to me to resemble in depth of ground colour the Corsican var. *ichnusa*. The Granada *A. urticae*, which were not uncommon on the plateau, sucking the flowers of a white *cistus*, did not show any approach to these, and, apart from the somewhat wider tawny margin to the hind wings, might have been typical British specimens.

On the plateau itself I came across several species I had not previously seen in Spain, amongst which was *Melanargia syllius*, with somewhat stronger black markings than my Hyères specimens; the fine black Spanish form of *Nisoniades tages* var. *Cervantes* was abundant, looking like a small *Erebia* whilst flying; *Anthocharis tagis* was also taken at the edge of the Darro gorge, and was in very fine condition considering the late date; a single female of *Aporia crataegi*, the only one I saw in Spain, had doubtless been blown up from the lower slopes of the gorge. *Zygæna lavandulæ*, a very distinct form, with only a small round red spot on the inferiors, boomed along in the sun in fair numbers; fine large *Nomiades melanops*, some of which exceeded 35 mm. in wing expanse, flitted round the *Dorycnium* plants.

Just where the road enters the plateau is a rather prominent knoll, around which each day about noon would be found flying one or more *Papilio feisthamelii* and several *P. machaon*; these latter were, however, quite safe from my best efforts. Here also I netted the only *Anthocharis belemia* var. *glauce* I saw at Granada, some three or four in number.

On May 13th I saw several dark Satyrid-looking butterflies on the slopes by the Genil, and after some trouble succeeded in netting one. My surprise was great to find that I had captured a male *Hipparchia semele*, considering that *H. semele* is not found until well on in July in such hot places as Corté in Corsica, and that it is found in England at the same date; it was unexpected to find it in Andalusia two months earlier, and at a height of more than 2000 ft. above sea-level; one wonders if it manages to get in a second brood there. Almost an equal surprise on May 15th was to net a fine example of *Thymelicus lineola*.

I had intended making certain excursions in the Sierra Nevada whilst staying at Granada, but the abnormal heat had so affected the ladies of the party I could not manage to do so, and unfortunately we had for this reason to shorten our stay at Granada and move to cooler quarters on the Bay of Biscay; accordingly we left Andalusia on the 18th of May. This was a disappointment, because not only are certain local species said to appear at Granada during the last few days of May, but it was most tantalizing to see the slopes of the Sierra Nevada so near and yet not be able to explore them. No doubt very good work could be done in them in June and July, but I understand accommodation of any kind is very difficult to get, and probably for a successful expedition tents and servants would be a necessity.

Youlgreave, South Croydon: July 10th, 1908.

ON THREE UNDESCRIBED FOSSORIAL HYMENOPTERA (*CRABRO* AND *PSEN*) FROM BORNEO.

BY P. CAMERON.

Crabro hewittii, sp. nov.

Black; antennal scape, clypeus, mandibles, palpi, the entire head below the eyes, the collar broadly, a slightly narrower band on the lower part of the propleuræ, prosternum, scutellum, a narrow line on the post-scutellum, and the legs, except the hind coxæ and almost the apical half of the hind tibiæ, bright lemon-yellow; the sides of the basal abdominal segments brownish. Wings hyaline, the stigma fuscous, the nervures blackish. Antennal flagellum fulvous. ♀. Length. 4 mm.

Kuching (John Hewitt).

Clypeus densely covered with silvery pubescence, its centre keeled, the apex of the keel projecting into a blunt tooth. Front minutely punctured, the vertex almost smooth; the ocelli in a triangle, the hinder separated from each other by about the same distance as they are from the eyes. Mesothorax very minutely punctured. Base of metanotum irregularly striated, its centre furrowed. First abdominal segment longer than the second, longish, its base not half the width of the apex.

Crabro dentipleuris, sp. nov.

Black; antennal scape, a line on apex of pronotum, tubercles, and scutellum yellow, the fore tibiæ and tarsi testaceous, the base of the hind tibiæ narrowly, and the calcaria and the hind metatarsus to near the apex pale yellow. Wings hyaline, the nervures black. The centre of the lower edge of the propleuræ with a stout triangular tooth, behind which is a rounded tubercle. ♀. Length, 5 mm.

Kuching (John Hewitt).

Eyes distinctly converging below. Apex of clypeus broadly rounded, its centre keeled. Apical half of mandibles rufous. Front closely, distinctly punctured, the vertex almost smooth. Ocelli in a triangle, the hinder separated from each other by about the same distance as they are from the eyes. Mesonotum and scutellum closely, minutely punctured. The whole metathorax smooth and shining, the base with a short distinct furrow; the apical slope with a wide depression. Propleuræ almost smooth, the mesopleuræ closely punctured. First abdominal segment clearly longer than it is wide at the apex, the base not quite half the width of the apex. Palpi fuscous. The body is covered with a short silvery pubescence.

Should be known by the stout, triangular, pleural tooth.

Psen marginicollis, sp. nov.

Black; the antennal scape, the four anterior tibiæ and tarsi, and the tubercles dark testaceous; the wings hyaline, the stigma and nervures black. Head smooth and shining, the eye orbits with a crenulated border, bounded on the outer side by a distinct keel. Front furrowed down the centre. Ocelli in a triangle, placed behind the eyes, the hinder separated from each other by a less distance than they are from the eyes. Temples broad. Occiput transverse, distinctly margined. Apical half of pronotum raised, the base of the raised part margined, projecting laterally into teeth. Mesonotum almost smooth, its apex with a distinct crenulated furrow, behind the centre of which is a triangular depression. The entire metathorax is coarsely reticulated. Pro- and mesopleuræ opaque. The narrowed basal part of the first abdominal segment is opaque, curved, fully one-half longer than the dilated apex. The central part of the propleuræ is raised, and it is surrounded above, below and at the apex by a striated furrow; the central part of the mesopleuræ is also surrounded by a striated furrow, the lower and upper of which unite at the apex. Length, 4 mm. ♀.

Kuching (Hewitt).

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 227.)

VARIA.—The two sexes differ so completely that it will be necessary to treat them separately.

♂. Up. s. f. w.: Lunules for the most part replaced by quadrate spots, the third from the bottom not usually projecting at all beyond the rest towards the base. Ground colour of both wings decidedly darker than the average *parthenie*. Outer subterminal line generally very distinct throughout its length, but sometimes only indicated by dots; the inner rarely present. Elbowed line varying greatly in distinctness, being sometimes thick throughout, sometimes only indicated by a few spots, dark or faint, at the costa, and by the marginal blotch; it is much less bent than in any other species. Stigma large for the size of the insect, and clear, not filled with black. Upper half of basal lines fairly, sometimes very, distinct. There is a considerable basal suffusion.

Up. s. h. w.: Outer line clearly defined, inner sometimes as clear, but oftener indistinct. At least the lower half of the extra line is usually indicated, unless enclosed in the large basal suffusion, which generally obliterates the basal spot. Discal spot rarely present unless embodied in the extra line.

Un. s. f. w.: Ground colour rather lighter than in the male of other species, but only the upper lunules and two spots within the outer subterminal line are lighter than the ground colour. Inner subterminal line rarely distinguishable, and outer subterminal and even inner edging line of border often obsolescent. Spots indicating the elbowed line usually very black and distinct, as are also the marginal blotch, stigma, and upper part of basal lines, which form a reniform stigma. Basal dash large and black, sometimes joining the marginal blotch.

Un. s. h. w.: Edging lines of border scarcely, if at all, arched. Bands very distinct. Terminal band brightish yellow, outer band almost of the ground colour of f. w. The outer portion of the central band is yellowish white, the inner portion of the same shade as the terminal band. In all the other species (except *deione* and *asteria*) the outer portion of this band is of the same shade as the terminal lunules. The third and fourth spots of the outer portion of the central band barely project beyond the others. Inner band variable in width, the light spot being generally very small or almost absent. The second spot of the basal band generally conspicuously large, and in a less degree the fourth. This band is of the colour of the outer portion of the central band.

♀. Up. s. f. w.: Ground colour of both wings somewhat lighter than that of the male, where it can be seen, but it is nearly always much suffused, and sometimes almost entirely covered with a blackish suffusion, which in fresh specimens has a marked greenish tinge. Both subterminal lines broad and distinct unless too much suffused; the inner is only slightly bowed out near the costa, and thence almost

straight. Lunules, when visible, as in the male, but sometimes reduced to tiny dots. Elbowed line generally very slightly marked, except at the costa, and by the marginal blotch. Stigma and space between the basal lines usually filled with dark scales.

Up. s. h. w.: Border and the two lines thick and suffused, and the basal suffusion often reaches the inner line, leaving only one or two rows of spots of the ground colour. No discal spot or extra line, and the basal spot is rarely visible.

Un. s. f. w.: The whole row of lunules and two costal spots within them are light. Both edging lines of the border and the outer subterminal distinct, and inner subterminal generally distinguishable. The other markings, including the costal spots of the elbowed line, generally slight or even absent, except the marginal blotch, though all are sometimes distinct.

Un. s. h. w.: As in the male, but the central and basal bands rather lighter, and sometimes silvery white. Terminal band sometimes darker, as in the male, but often of the same shade as the *outer* portion of the central band. The light spot is of the same shade, and not, as a rule, very small. The lunules of the outer band are generally small, as in *aurelia*, leaving a considerable part of the band to be filled in with dusky scales.

AURELIA.—Up. s. f. w.: The border and the two subterminal lines generally broad but sharply defined in the male, but often less broad, though more suffused in the female; the inner one is rather less bowed below the costa than in the other species, except *varia*, and generally bends slightly outwards at the inner margin. The nervures, especially the lower ones on both wings, are more broadly edged with black than in the other species, and in the male are sharply defined, giving a neat lattice-work appearance, which is blurred in the female. Elbowed line generally clear, but often consists of a series of large or small spots, the middle portion being sometimes wanting. Stigma and upper half of basal lines clearly defined, and generally enclose scales of a darker shade than the ground colour. Basal suffusion specially noticeable along the inner margin.

Up. s. h. w.: Inner line usually much broader than outer. Discal spot and extra line present, but frequently in the male and almost always in the female swallowed up in the basal suffusion. Basal spot generally visible in the male, and sometimes in the female; a second spot of the ground colour edged with black, but inside the extra line, accompanies it. Nervures broadly black, as in the fore wing. On both wings the border is often split up, especially in the female, into two narrow dark lines containing a line of the ground colour.

Un. s. f. w.: Lunules light at the costa, and sometimes down to the anal angle; outer subterminal clearly defined and generally quite dark, often with a whole row of light spots indicated within it, those near the costa being very conspicuous. The spots near the costa representing the elbowed line are not infrequently *rings*. Outlines of the stigma and the basal lines generally distinct, as are the marginal blotch and basal dash, but less so in the female than in the male.

Un. s. h. w.: Inner edging line of the border only very slightly arched; the border itself darker than the lunules. The separation of

the terminal and outer bands in the female is often very indistinct, and the latter is much lighter than is usual in other species. In both sexes the lunular portion of the outer band is very narrow, not occupying much more than half the band. The inner part of the central band is darker than the outer; the proportion between these divisions varies greatly. Fifth spot of basal band usually present; light spot generally rather small.

BRITOMARTIS.—The two broods differ greatly in size, the second being very much the smaller, though a large specimen of the second may closely approach in size a small specimen of the same sex of the first. Both broods are *very* variable in the breadth and distinctness of the markings of the upper side. The outer margin of the fore wing is generally conspicuously angular about a third of the way down.

Up. s. f. w.: The black border has a tendency to divide and show a line or a series of spots or dashes of the ground colour. Lunules generally distinct but narrow, the lowest, especially in males of the first brood, being sometimes suppressed. The tendency of the first brood seems to be to have the outer subterminal line broader, of the second narrower than the inner; both are generally distinct and fairly broad, though sometimes the inner one especially is blurred. This latter approaches most nearly in shape to that of *aurelia*, but it is on the whole the straightest of the group, owing to the slightness of its costal bend. Elbowed line, except in specimens where the whole surface is blurred, generally broad and distinct, with a broad thick marginal blotch, which in the female sometimes contains a double line thus \succ , almost of the shape of the characteristic blotch of *berisalensis*, but of the ground colour instead of black. Sometimes the whole black marginal blotch is of this form, *e.g.* in the co-type in the South Kensington Museum. The stigma is much like that of *athalia*, but not filled up with black except in males of the first brood, though in the females of this brood, and occasionally in both sexes of the second, it contains a number of dark scales. The basal lines are strongly marked, the space between them being sometimes filled in with black, especially in first-brood males.

Up. s. h. w.: The border has less tendency to divide than that of the fore wing. The lunules are generally distinct, but often very narrow. The outer and inner lines vary much in breadth. The discal spot and the upper part of the extra line are generally clear of the suffusion, and sometimes the whole of the line is visible. In Zeller's example, however, the extra line is involved in the suffusion. The basal spot is clear and generally as conspicuous as in *athalia*.

Un. s. f. w.: Generally speaking, by far the most heavily and distinctly marked of the group, especially in the male. The inner edging line of the border is more or less arched or angled; the lunules are often narrow, but light and clearly marked, except in dark specimens of the first-brood males. The outer subterminal line shows as a dark inner edging to the lunules, and is generally rather suffused, especially towards the anal angle. The inner subterminal is only indicated in the female, but generally clear and pronounced in the male, and is less straight than on the upper side. Between the two is a row, or part of a row, of light spots, which often recurs between the inner one and

the elbowed line. The latter is nearly always distinct and pronounced throughout its entire length, a character very rare in any other species. The marginal blotch is not large, but has a tendency to reproduce at least the inner half of the characteristic mark of *berisalensis*, in consequence of its frequent junction with another dark mark nearer to the base, which usually takes more or less the shape of a V, or of the symbol of Aries Υ , placed sideways, and opening inwards instead of outwards, as in *berisalensis*. Sometimes the whole x is shown thus Σ . The outlines of the stigma, and three basal lines, with a basal dash, are also strongly marked.

Un. s. h. w.: The inner edge of the border is arched or angled (slightly angled in Zeller's specimen). The lunules vary much in size, being generally large, but occasionally very narrow. The outer band is interrupted towards the costa, as in *dictynna*, and contains, like *dictynna*, a dark spot, or at least indications of one, on or near the outer edge in each interneural space below the light patch or patches interrupting the band. This character, to which Rühl draws attention, is more pronounced in most of the Reazzino specimens, though quite distinguishable in Zeller's, and clear in the second lunule. The inner division of the central band is darker than the outer, and projects so far outwards in the third and fourth interneural spaces below the costa as often to push the two corresponding spots of the outer division right outside the rest of the band. In Zeller's specimen they are not outside, though pushed far outwards. The inner band is often noticeably broad in the centre, and the light spot large. The central spot of the basal band is rarely conspicuously small.

DICTYNNA.—The ground colour of the upper side, especially in the male, is often much obliterated by the black suffusion.

Up. s. f. w.: The lunules, except the third from the anal angle, and occasionally even this, are generally reduced to a series of narrow streaks or small spots (though sometimes all are distinct and of moderate size in the female) in consequence of the outer subterminal line more or less coalescing with the border. Inner subterminal broad and only slightly straighter than in *athalia*. Elbowed line often obliterated by the suffusion, but when visible not generally very broad. Stigma rather narrow, and almost always filled in with black, or at any rate with dark scales, as is also the space between the basal lines. In the female the ground colour is often lighter between the inner subterminal and elbowed lines.

Up. s. h. w.: The black suffusion, especially in the male, nearly always extends almost to the inner line, and occasionally over the whole wing. Lunules usually distinct and light in the female, but rarely distinct and never light in the male. The ground colour usually shows in spots between the outer and inner lines, and often, especially in the female, inside the inner line. Basal spot rarely visible, though sometimes distinct in the female.

Un. s. f. w.: Both edging lines of the border very distinct, the inner one being much angled between the nervures. Lunules generally distinct and lighter (usually much lighter) than the border. Outer subterminal shows as a dark suffusion, sometimes more con-

spicuous towards the anal angle, and within it is a row, or part of a row, of lighter spots, followed by the inner subterminal line slightly indicated as a darker shade, but occasionally showing as a row, or part of a row, of dark spots, and sometimes quite wanting. Elbowed line generally indicated in the usual way, but sometimes traceable throughout, and sometimes wholly wanting except for the marginal blotch in the female. Outlines of stigma and basal lines generally distinct, and always visible, even when the other markings are almost absent; there is also a third short line near the base.

Un. s. h. w. : Inner edge of the border arched, especially near the costa. In the outer band the dark edging of the lunules is suffused, and each contains a dark spot in or near the outer edge. This band is nearly always interrupted by lighter patches in the last two or sometimes three interneural spaces before the costa, but much less markedly than is usual in *britomartis*. The three light bands vary from silvery white to bright yellow, but are always light, particularly the central one, in the female. Central spot of basal band seldom noticeably small.

ASTERIA.—Up. s. f. w. : Lunules generally appear as quadrate spots, lighter—sometimes much lighter—than the ground colour, the third rarely projecting much inwards, and often smaller than some near the costa. Outer subterminal line rather sharply angled outwards nearly half-way down; both are very variable in thickness, the inner not greatly bowed outwards. Elbowed line thickish and strongly bent, sometimes appearing to run into the lower half of the inner subterminal. Marginal blotch very variable, sometimes even showing the *x*-mark of *berisalensis*. Stigma also very variable, ranging from a mere line to a round outline, filled or not filled with black. Basal suffusion of variable extent often including the basal lines and sometimes the lower half of the elbowed line. Space between the basal lines, when visible, generally filled with black. The ground colour of the upper side often shows indications of lighter and darker alternate bands, sometimes so strongly as to suggest *merope*.

Up. s. h. w. : Border occasionally shows signs of dividing. Both lines generally thick; extra line and discal spot covered by the suffusion; basal spot sometimes conspicuous, but generally covered.

Un. s. f. w. ; Only one edging line to the border. Lunules rather quadrate and very light; a second and often a third row of light spots are visible, but generally slightly darker than the lunules. The outer subterminal shows as an edging to the lunules, the inner as at least a darker shade. The elbowed line shows sometimes only on the costa and inner margin, but is sometimes distinct throughout; the costal spots representing this line are sometimes ringed. The marginal blotch is as variable as on the upper side. Outlines of stigma and basal lines clear.

Un. s. h. w. : Only one edging line to border. This is the outer, for there are indications of the inner on a Tyrolean specimen in the Leach collection. Terminal band broad. Outer band very variable in the form of the lunules, proportion of the two parts, and depth of colour. Central band generally almost unicolorous, and the dividing

black line generally very slightly represented, or even absent. Inner band dark, not usually very broad in the centre. Light spot of varying size and shape. Basal band has the second spot conspicuously the largest. The light bands vary in shade from white to pale buff.

(To be continued.)

NOTES AND OBSERVATIONS.

ZYGÆNA FILIPENDULÆ WITH LIGHT PINK SPOTS AND HIND WINGS.—On July 23rd I was walking on the hill at Lewes when a very large *Z. filipendulæ* settled on the grass just in front of me. Unfortunately I had neither net nor box available. It remained, however, long enough for me to see that the spots on fore wings and the hind wings were of light pink instead of the usual carmine.—JOSEPH ANDERSON; September 23rd, 1908.

EPINEPHELE TITHONUS PAIRED WITH *E. HYPERANTHUS*.—The above species were observed paired in North Cornwall on July 27th by Mr. A. L. Rayward and myself. The male was *E. tithonus*. There is a record in the 'Entomologist,' vol. xix. p. 230, by Mr. Percy Rendall, of *E. ianira* being found paired with *E. hyperanthus* at Brockenhurst. So far as I am aware, the pairing of *E. tithonus* with *E. hyperanthus* has not previously been recorded.—A. HARRISON; Delamere, Grove Road, South Woodford.

OVIPOSITION OF A HYPERPARASITE (CHALCID) OF *PIERIS BRASSICÆ*.—At the end of June, 1908, some larvæ of *P. brassicæ* were sent to me from Yeovil, and on July 1st large numbers of the larvæ of the Braconid (*Apanteles glomeratus*) emerged from some of them. Whilst watching this process I chanced to notice that a small hymenopteron was paying particular attention to an apparently healthy Pierid larva, and seemed to be ovipositing therein. I isolated the larva and its tormentor, and the ovipositing still continued. Two days later the usual batch of *Apanteles* larvæ left this caterpillar and spun their cocoons. On July 13th several imagines emerged from these cocoons, about half producing the parasite. On July 29th the expected hyperparasite emerged from the remaining cocoons. The point of this note is to show that the hyperparasite oviposits in the larva of *Apanteles* while the latter is still within the body of its host, and not, as is often supposed, either in the Braconid larva soon after emergence from the Pierid, or after it has spun its cocoon.—G. T. LYLE; Brockenhurst.

ABRAXAS GROSSULARIATA, ab.—The pretty variety of this species figured on Plate vii., fig. 1, was taken with three others at Saltaire, Yorkshire, July 3rd, 1908, by Mr. J. A. Beck. The base, and outer border of post median band on the fore wings is yellow; and there is a tinge of the same colour about the middle of the band on the hind wings. The specimen is rather larger than shown in the photograph.—R. S.

ABRAXAS SYLVATA (ULMATA).—The curiously blotched and irregularly banded aberration of this species shown on Plate vii., fig. 2, was taken by Mr. Arthur J. Scollick in a wood near Chalfont, Bucks, during the summer of 1907. I may mention that in July of the present year, when collecting in the same wood, I picked up, among other interesting forms, a specimen with lead-coloured hind wings, but normal fore wings.—R. S.

CAPTURES AND FIELD REPORTS.

POLIA CHI AT TORQUAY.—While bicycling along a road in the neighbourhood of Torquay on August 27th I found several specimens of *Polia chi* at rest on the tree-trunks. Is it usual to find this species so far south?—J. S. CARTER; Radley College, Abingdon.

[Other Devonshire localities from which this species have been recorded are—Dartmouth (common), Plymouth, Dartmoor, and Avonwick.—ED.]

POLIA CHI IN BERKSHIRE.—Mr. W. H. Warner of Fyfield, Berkshire, recently sent me a moth that he thought must be a specimen of *P. chi*. I was very pleased to confirm his identification.—RICHARD SOUTH.

RHODOMETRA (STERRHA) SACRARIA IN DEVONSHIRE.—On September 12th last, I took a beautiful female specimen of *Rhodometra sacraria* sitting on a dock-stem in South Devon about 10 p.m.—H. M. EDELSTEN; Forty Hill, Enfield, Middlesex, September 25th, 1908.

PRIONUS CORIARIUS, Linn., AT SUGAR.—Whilst "sugaring" in Epping Forest on July 23rd, I took a large female of this species upon the sugar patch. I know of two other specimens taken last season in the same way. I should like to know if any other entomologists have had this experience.—H. E. HUNT; Walthamstow, Essex, September 7th, 1908.

CERURA BICUSPIS AT CHESTER.—At midnight, May 29th, I found a nice specimen of this rare moth at rest on the city wall just under an electric lamp. This is the first record for Chester. Other records for Cheshire are two larvæ by Mr. F. C. Woodforde at Wybunbury Moss, and two fine imagines at the White Hall electric light, near Tarporley, by Mr. J. H. Stock.—J. ARKLE; Chester.

PYGÆRA ANACHORETA, &c., IN ESSEX.—I have pleasure in recording the capture on August 8th of a specimen of *P. anachoreta* at Clacton-on-Sea at electric light. This proved to be a female, and ova were deposited on August 9th, 10th, and 11th to the number of one hundred and sixty-three. They commenced hatching on August 20th, and are now feeding up on poplar. This appears to be a new locality for this species, the only records that I can find having previously

been on the Kentish coast, and then chiefly in the larval stage. I also obtained by the same means a specimen of *Pygæra curtula* on August 14th, which was also a female, and from which I obtained only twenty-six ova. No others of these species were seen, and it is curious to note that they should both be females, thus proving that it is not always safe to assume that moths caught at light are necessarily males.—GEO. P. KITCHENER; 13, Birchington Road, Crouch End, N.

OCCURRENCE OF *ACHERONTIA ATROPOS* IN HANTS.—This is evidently another *atropos* year. I have already had three pupæ brought me dug up among potatoes in three different gardens. Two years ago no fewer than twenty-seven larvæ were found in a kitchen garden in the neighbourhood, but they were all destroyed by the gardener's spade as "venomous beasts" before I heard of them.—(Rev.) J. E. TARBAT; Fareham, Hants.

ACHERONTIA ATROPOS IN SUSSEX.—Three larvæ of this species were brought to me the latter end of August; two of them pupated all right, but the third was unfortunately injured, and died in the larval stage. This is the third year in succession in which I have obtained either larvæ or imagines of this species. A friend of mine at Eastbourne has also obtained a specimen of the moth this week.—W. JARVIS; 22, Leicester Road, Lewes, Sussex.

ACHERONTIA ATROPOS IN NOTTS.—On September 22nd a good specimen of this species was brought to me, having been taken at rest on an electric light standard in this town. I have no previous record of the imago for this district.—E. MAUDE ALDERSON, F.E.S.; Worksop, Notts.

COLIAS EDUSA IN DORSET.—On August 8th, when sitting in a train which had drawn up for a few minutes outside Upwey Station, between Dorchester and Weymouth, I saw a male *C. edusa* on the flowers of the railway-bank just under the windows of the carriage.—FRANK E. LOWE; Guernsey.

This butterfly is about here this month, but very sparingly. I have only seen one specimen inland; the usual haunt of the species is the under cliff, which for miles along this coast represents the result of former landslips.—R. MELDOLA; Lyme Regis, September 15th, 1908.

COLIAS EDUSA IN HANTS.—This butterfly occurred sparingly around Chichester during July and August.—JOSEPH ANDERSON; September 23rd, 1908.

COLIAS EDUSA IN KENT AND MIDDLESEX.—I had the pleasure of capturing, after a stern chase, a somewhat ragged female of *Colias edusa* ab. *helice* on 8th inst. near Deal, a clover patch being quite near. I may add that *C. edusa*, *Pyrameis cardui*, and *P. atalanta* were fairly abundant here.—F. H. MOORE; Barnet, September 25th, 1908.

COLIAS EDUSA, &c., IN HERTS.—On September 2nd I saw a specimen of *Colias edusa* caught by two boys near Roman Camp, Letchworth. I was collecting, and was sorry to see evidence that these juveniles had no knowledge of entomology, as they had this species and “whites,” as well as others, mixed up in a match-box. Such wanton destruction is to be regretted. The variety *helice* was seen by a friend a few days after; it flew past him, when he had a good view of it. This occurred in the same place. A specimen of *P. cardui* was caught in Garden City on September 2nd. — (Rev.) E. EVERETT; Ashleigh, Pix Road, Letchworth, Hitchin, September 25th, 1908.

HUNTINGDONSHIRE DRAGONFLIES, 1908.—In the course of a visit to Huntingdonshire during the second half of last month, I was able to add several fresh species to my list of Odonata (known locally as “needles”) occurring in that county (‘Entom.,’ 1907, p. 257). The most interesting addition was *Lestes dryas*, of which a few males and females were secured, on July 27th and 31st, in deep ditches well furnished with vegetation, at two localities near Ramsey. The specimens taken were in fully adult condition, and some of them were paired. It will be remembered that in 1893 and 1897 Mr. K. J. Morton obtained this scarce insect in the adjoining county of Cambridge.

Other additions to my list were:—*Sympetrum striolatum*, newly-emerged females, Hartford (July 29th) and Ramsey (July 31st); *S. sanguineum*, adult males and females, Ramsey (July 27th and 31st); *Lestes sponsa*, occurring with *L. dryas*; *Ischnura elegans* var. *rufescens*; and *Enallagma cyathigerum*, flying in great swarms over the Forty Foot Drain. Of the last-named species, both forms of the female were taken. The exceptionally favourable opportunities for observation afforded by the Forty Foot Drain enabled me to satisfy myself beyond question that males, at all events, of *E. cyathigerum* frequently fly backward as well as forward. The insect is seen to hover on the wing for a few seconds, and then the backward flight begins, which is sometimes sustained for a foot or more, although more often the forward movement is resumed when a retrograde journey of a few inches only has been accomplished. The following species and variety, previously recorded from Hartford, were met with again at that place:—*Calopteryx splendens*, one pair (July 21st); *Erythromma najas*, scarce (July 29th); *Ischnura elegans*, with its dark var. *infuscans*; and *Agrion pulchellum*, scarce (July 21st). Teneral individuals of *I. elegans* occurred abundantly where the species was present, and it was plain that the second emergence was taking place. *Sympetrum scoticum* was seen in the county, but not taken, as were also *Æschna grandis* and, probably, *Æ. cyanea*, but the scarcity of larger dragonflies, both as to species and numbers, was quite remarkable.—F. W. CAMPION; 33, Maude Terrace, Walthamstow, Essex, August 31st, 1908.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 25th*, 1908.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Hy. J. Turner exhibited a female specimen of *Agriades bellargus*, caught at Ranmore, measuring only 22 mm. in expanse, and an example of *Hesperia malvæ* from Eastbourne, with hind wings normal, but having coalesced blotches on the fore wings as in ab. *taras*.—Mr. Newman, living larvæ of *Xylina semibrunnea*, with that of *X. socia* for comparison, pointing out the peculiar green ground tint and the more distinct lateral line of the former.—Mr. Adkin, light and dark forms of *Biston hirtaria*, pointing out that the difference was permanent through each moult, and that the depth of colour did not seem to depend upon environment.—Mr. West (Greenwich), the following Hemiptera taken by him in June in New Forest :—*Cicadetta montana*, *Sigara minutissima*, *Eysarcoris æneus*, and *Orthostira cervina*.—Mr. Carr, the nymph-skin of the large dragonfly *Anax imperator*, found at Oxshott.—Mr. Sich, a larva and pupa of *Parnassius apollo*?, sent by Mr. Egbert Sich from the Engadine, Switzerland, and stated that when irritated the larva protruded an osmaterium. Mr. Tutt called attention to the waxy secretion covering the surface of the pupa, which effectually secured it from the damp of the marshy ground upon which it pupated.

July 9th.—The President in the chair.—Mr. Newman exhibited a rayed variety of *Abraxas grossulariata*.—Mr. West (Greenwich), a short series of the local coleopteron *Dytiscus circumcinctus*, from Great Yarmouth, and specimens of the rare *Bidessus unistriatus* from the same place.—Mr. R. Adkin read a short account of the various meetings held during the Congress of the South Eastern Union of Scientific Societies at Hastings. Messrs. Sich and Step made a few remarks on the excursions made during the Congress.

July 23rd.—The President in the chair.—Mr. Sich exhibited *Cerostoma xylostella* (female), and said that it was bred from a larva without the broad reddish stripes down the back, which form he said might be sexual.—Mr. Turner, living larvæ in their curiously contorted cases of the very rare *Coleophora siccifolia*, taken by Mr. Sich and himself at Chiswick. He also showed a large number of Pyralidæ from North America.—Mr. Newman, a living hybrid larva, *Smerinthus ocellata-populi*, and noted its distinctive characters. He also showed bred specimens of *Argynnis paphia* var. *valesina*, *Boarmia repandata* var. *conversaria* (produced in the third generation), and the yellow form of *Callimorpha dominula* (also of the third generation).—Mr. Adkin exhibited series of *Xylina semibrunnea* and *X. socia*, and read notes on the differentiation of the two species, calling attention to the wing form, the black blotch in the anal angle of the former, and the absence of any distinct band in the same species. Mr. South, in addition, noted the inner marginal line in *X. semibrunnea*, the brown,

not black, abdominal tufts in *X. socia*, and the much darker thorax of the form.

August 13th.—The President in the chair. — Mr. C. W. Spurring, of Blackheath, was elected a member. — Mr. R. Adkin exhibited a series of *Odontopera bidentata*, bred from melanic parents from Yorkshire, and read notes on the forms. All but three followed the parents. — Mr. Newman, bred specimens of *Argynnis paphia* and *A. aglaia*. — Mr. Edward, a female *Nemotois cupriacellus*, taken at Byfleet. He also showed a large number of Diptera, Hemiptera, and Hymenoptera taken by him at Cannes, Fontainebleau, and Grandaneza. — Mr. Sich, the larva of *Aristotelia stipella* var. *næviferella*, a miner in *Chenopodium* leaves and the rare alien yellow knapweed (*Centaurea solstitialis*), found at Chiswick. — Mr. West (Greenwich), the following Hemiptera from Esher:—*Salda cocksi*, *Cyrtorrhinus pygmaeus*, *C. caricis*, and *Nabis boops*, with *Bryocoris pteridis*, from Carlisle. — Mr. B. H. Smith, ova of *Porthesia chrysorrhæa*, laid on sea-buckthorn at Deal. — Mr. Step, on behalf of Mr. Carr, a variegated form of *Senecio jacobææ* from Box Hill.

August 27th.—The President in the chair. — M. R. Adkin exhibited two series of *Dictyopteryx bergmanniana*, one bred from garden rose and the other from wild burnet rose, and read notes on the different habits of the two broods of larvæ. — Mr. Turner, a light form of *Crampus chrysonuchellus*, characteristic of Eastbourne, and two forms of *Eurrhynx urticata*, one having the marginal spots small and well separated, the other having them coalesced into a wide band. — Mr. Brown, a specimen of *Leucania flavicolor* from Benfleet. — Mr. Newman, examples of the hybrid *Smerinthus ocellata-populi*, just bred; *Crymodes exulis* from Shetland, including females; living larvæ of *Dicranura bicuspidis* from Tilgate Forest; an *Abraxa grossulariata* with the hind wings with only rayed marginal spots and the discoidal; a *Melanargia galathea*, the left hind wing of which was var. *procida*. — Mr. Joy, a living larva of *Cyclopides palæmon* (*paniscus*). — Mr. Cowham, two *Amphidasys betularia*, one having the basal spot absent on the fore wing, but with white discoidal spots, and other having a large whitish costal blotch on the lower wing. — Mr. B. H. Smith, a bred series of *Eugonia polychloros* from the New Forest, including a dark smoky form. — Mr. Goff, a *Rumicia phleas*, showing a complete absence of copper on the lower wings. — Mr. Sich, mines of *Nepticula acetosæ* from Surrey, and gave notes on the life-history of the species. — Mr. Fremelin read a short paper entitled "Insects as Carriers of Disease." — HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *September 1st, 1908.*—A resolution was passed in support of The Public Rights of Way Bill and the Access to Mountains Bill. — Mr. J. A. Clark exhibited *Arctia caia* ab., Hailsham, June, 1908, the upper wings being deep chocolate-brown with only slight traces of usual cream ground colour, and under wings smoky black with intense black spots and pinkish margin. — Dr. G. G. C. Hodgson exhibited *Nemoria viridata*, Surrey, May and June, 1908, including female with usual white lines very faintly marked, and another female with two

white striæ, one on costa of secondaries, and another just above centre of primaries; also larvæ of this species found feeding on *Genista anglica* and heather blossoms.—Mr. A. W. Mera, *Malacosoma (Bombyx) castrensis* from Essex, including a unicolorous buff aberration.—Mr. J. Riches, a series of *Plusia moneta* from Hornsey.

September 15th.—Mr. J. A. Clark exhibited *Sirex juvencus*, female, two and a quarter inches across, taken in his garden at Crouch End.—Mr. T. H. L. Grosvenor, variable series of *Cænonympha pamphilus*, including specimen with ocelli on under side of fore wings obsolete.—Dr. G. G. C. Hodgson, pupæ of *Lycena bellargus* in lightly-spun cocoons of silk and leaves; also a bleached *Argynnis euphrosyne*, Sussex, May, 1908.—Mr. G. H. Heath, *Anosia plexippus* found dead in the grass at Sandown, Isle of Wight, September 13th, 1908, while searching at night for *Aporophyla australis*.—Mr. L. W. Newman, *Crimodes exulis*, from Shetlands, including a specimen of female, which is rarely met with; a variable lot of *Abraxas grossulariata*, including var. *varleyata*, from Yorks; *Argynnis paphia* ab., with upper wings suffused with black, save for small area at base; and a yellow *Arctia dominula*—in connection with the latter exhibit, Mr. Newman stated that the imagines raised from a pairing of same with type proved to be all typical, but the progeny of these typical specimens included twenty-five per cent. of the yellow form.—Mr. C. P. Pickett, *Epinephele hyperanthus* var. *obsoleta*, Dawlish, July, 1908; also *Camptogramma bilineata*, with inner line on upper wings much accentuated, so as to form a black blotch.—Mr. L. B. Prout, *Zonosoma linearia*, from Ashford, showing a somewhat similar exaggeration of central line on fore wings.—Several members mentioned having received advice from friends, entomological and otherwise, on the south coast of large immigrations of Pieridæ.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

Forest Entomology. By A. T. GILLANDERS, F.E.S., Woods Manager to His Grace the Duke of Northumberland, K.G. Pp. i–xxii and 1–422; with 351 illustrations in the text. Edinburgh and London: William Blackwood & Sons. 1908. Price 15s. net.

THIS well-illustrated volume opens with some general remarks on classification, life-history, and structure of insects. Then we have ten chapters as follows:—1. Eriophyidæ (Gall-mites); 2 and 3. Coleoptera; 4 and 5. Hymenoptera (oak-galls, sawflies, &c.); 6. Coccidæ; 7. Lepidoptera; 8. Aphididæ; 9. Diptera. Chapter 10 is divided into Part 1. Psyllidæ, and Part 2. Cicadidæ. Chapters 11–13 deal with Collecting, Preparation and Mounting, Insecticides, &c., and Beneficial Insects. A list of trees and their injurious insects comprises Chapter 14. There is also an index of six pages.

Perhaps the best chapters are those on the Coleoptera, especially that in which the Scolytidæ are considered, and the Hymenoptera. The order Lepidoptera is not treated at any great length, and the

only Noctuid moth referred to is *Trachea piniperda*, which, although it devours the needles of Scots pine, is not regarded as a serious pest. We should add here that the author deals with his subject mainly from the economic point of view.

The author expressly states that he has not exhausted the subject, and we agree with him in this; but as first aid in the study of forest entomology the book has considerable merit, and will be exceedingly helpful.

In remarks on *Dioryctria abietella* (p. 258), the larvæ of the species are stated to be injurious to the cones of spruce fir (*Picea excelsa*) and silver fir (*Abies pectinata*). There is presumably some confusion here, as it is the larva of *D. splendidella* that feeds in cones; that of *D. decuriella* (*abietella*) attacks the shoots of *Pinus sylvestris*. The last-named species is well known to occur in the North of England, but only one example of *D. splendidella* has hitherto been recorded from the north (Hartlepool, 1891).

Among observations upon members of the Tortricid group of moths, we note that the larva of *Pædisca ophthalmicana* is blamed for doing damage to holly. We should say that moths reared from larvæ living in packets of terminal leaves of the holly, as depicted on page 266, fig. 253, would be referable to *Rhopobota* (*Grapholitha*) *nævana*.

The species represented on page 269, fig. 256, is certainly *Retinia buoliana*, but moths bred from larvæ feeding in the leading shoots of Scots pine, as illustrated (fig. 255), are usually *R. pinicolana*, a very closely allied but clearly distinct species.

These possible errors in identification are referred to more particularly to emphasize the author's caution in the preface, where he remarks: ". . . I trust that the student will take up the subject with the object of making a study of it on his own account, and verify each point by observation and rearing."

Thirty-first Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society. Session 1907.

IN addition to the reports of meetings, this excellent little volume comprises among its contents the Vice-President's Address, by J. Harold Bailey, M.B., Ch.B. (pp. 18-40), which deals with the Coleoptera of the Isle of Man, and is a valuable contribution. The Coleoptera of Lancashire and Cheshire, by W. E. Sharp, F.E.S., an important annotated list of species (numbering 1486) found in the two counties, is also included, but this is paged separately, 1-75. A portrait of J. R. le B. Tomlin, M.A., F.E.S., is finely printed on plate paper.

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MALACOSOMA NEUSTRIA AB.

BY THE HON. N. CHARLES ROTHSCHILD, F.E.S.



THE above curious aberration of *M. neustria* was reared on August 26th, 1907, by Mr. Frederick Palin, of Ashton Mill, near Oundle, from a cocoon collected in the village of Ashton.

THE BASSES-ALPES IN AUGUST.

BY H. ROWLAND-BROWN, M.A., F.E.S.

CIRCUMSTANCES conspired to keep me in London until the end of July, and to shorten the days which each year I endeavour to devote to the study of the butterflies of the Continent. I thought, however, that there might be compensations in a visit to the Basses-Alpes, even thus late, and *Erebia scipio* was the particular objective of my journey. My records for this interesting species show that it affects the Dauphiny Alps as well as the Dourbes at Digne. M. Chrétien, an authority on the mountain butterflies of France, has taken it at Monetier-les-Bains: Mrs. Nicholl informs me that it occurred not uncommonly some years back at Vallouise—both places within easy access of the Briançon railway. But never having tried Barcelonnette, and finding that the French collectors of an earlier day had met with it in this region, I detoured—most unluckily as it turned out—at Prunières, and the same evening (August 1st) found

myself in this pleasant little Alpine town. Here I spent three days. But though twice I ascended to the higher *Erebia* zone on the path (?) to the Pain de Sucre, on both occasions cloud and heavy rain, succeeding bright mornings, destroyed any chance I may have had of netting *scipio* there, and I was compelled to defer my hopes elsewhere. While the sun shone, however, there were many butterflies on the wing, though for the most part decidedly *passés*. Just outside Grenoble, from the train window, I had noted fine fresh examples of *Papilio podalirius* of the second brood, and *Satyrus circe*. On the mountain-paths round Barcelonnette the commonest insects were unquestionably *Polyommatus damon*, and the same splendid Satyrid, with battered Argynnids and Melitæids—*D. paphia*, *A. adippe* (none seen of the *cleodoxa* form, generally common in the South of France), *A. niobe*, *M. phœbe*, females; while of the fresher order, fine, brightly-coloured *M. didyma*, with typical females, and *Brenthis ino* among the wild raspberry were abundant. Following some distance up the valley the rivulet which descends from the Pain de Sucre, and falls into the Ubaye at the iron town-bridge, I found *Erebia neoridas*, males, in fine condition, single *Polygonia c-album*, and representatives of all the August Satyrids—*S. hermione*, *S. alcyone*, *S. statilius* var. *allionia*, *S. cordula* (worn), *Hipparchia briseis*, fine and large, and *H. semele*, of course, with brilliant *Pararge mœra* var. *adrasta* on the warm stone walls which separate the little plots of cultivated land. Most of the lower *Erebias*, however, had obviously seen their best days. *E. stygne* was in rags; *E. æthiops* not much better, and a few *E. ligea*. But at about 5000 ft. the condition of most things showed an improvement. *E. euryale*, a quite undistinguished form, was swarming, and scattered *E. tyndarus* disclosed the form *dromus*. On a marshy patch *Cænonympha iphis* put in an appearance; and I should add that faded females of *C. dorus* and *C. arcania* were also to be seen on the lower paths, with *Thymelicus actæon*, *T. lineola*, and occasional *Pyrgus sao*. "Blues" were conspicuous by their absence, except *damon*. *P. corydon* was quite rare: one or two *P. escheri*, and *P. alexis*, a single *P. baton*, and a worn male *P. optilete* high up, with *Rusticus argyrognomon* constituted a meagre bag.

Noting in Mr. Wheeler's 'Butterflies of the Central Alps' that Allos is given by Mr. Powell as a locality for *E. scipio* I transferred my attentions thither on the 5th. The drive over the Col d'Allos in the "Cars Alpins" is pleasant enough, the road gradually rising from the valley by lavender-covered slopes alive with *Colias edusa*, *Satyrus cordula*, and *Callimorpha hera* to the regular zone inhabited by *Parnassius apollo*, and I daresay many other Alpine species. But as the sun now disappeared for something like forty-eight hours, and the rain descended during the whole of my first day at Allos without a moment's inter-

mission, the Col, entomologically speaking, is to me a blank. Nor do I fancy that the Allos side would be productive, as it is wholly devoid of forest and grazed apparently to the summit, which commands but a moderate view of the surrounding mountains. The 7th and the 8th of August as well as the 10th I devoted entirely to the neighbourhood of the beautiful Lac d'Allos, with the intention of tracking down the elusive *scipio*. But my evil star was in the ascendant, and though I penetrated high up beyond the lake itself, which lies at over 7000 ft.—an expanse of lapis-lazuli in a setting of sombre peaks, not in shape unlike the Dolomites—again clouds and rain disappointed my search.

Except on the 8th, when I was soaked to the skin in a terrific thunderstorm which found me with no better shelter than a willow-tree, the lower stages of the mule-path that leads first to the forester's house—round which the reafforestation of the bare hills is in full swing—were warm and sunny. About a quarter of an hour from the village the track is shaded by a wealth of wild fruit trees—pears, apples, cherries, and sloes, and hereabouts worn males of *Thecla acaciæ* were drinking in the honey of the white stone-crop, while the females might be seen ovipositing on the sloe-bushes—always favouring the meanest specimens: *Thecla spini*, a little less disreputable, was also in evidence, with worn *Limenitis camilla*. In the open, fresh *Pontia daplidice* and *Erebia neoridas* males were again in profusion, with *Epinephele lycaon*, males of *Chrysophanus virgaureæ*, and *Hesperia comma*, the uncut meadows revealing occasional *Aporia crategi*, and by the woodsides innumerable *Erebia euryale*. Curiously enough, with the exception of a single brilliant *Aglaïs urticæ* on the shore of the Lac, I do not remember to have seen a single Vanessid on the Basses-Alpes in the first fortnight of the month except *P. c-album*.

The mountains round Allos, as the inhabitants are proud to inform us, partake much more of the character of the Swiss Alps than of the Basses-Alpes. But this season, at all events, butterflies did not appear in anything like the profusion to which those who collect in Switzerland are accustomed. Except *Cænonympha iphis*, which occurred wherever its food-plants grew, I cannot say that any single species was really common. At 5500–6000 ft. males of *Chrysophanus hippothoë* var. *eurybia* were in evidence, and I took a female of *C. virgaureæ* which stands midway between the type, and the var. *zermattensis* in the distribution of colour. *Brenthis amathusia* was rare, as also *B. pales* var. *arsilache*, their condition showing that it was not a result of my coming too late upon the ground. Small *E. goante*, a form of *E. var. cassiope* (= *obsoleta*, Tutt) and *E. var. dromus*, made up the *Erebia* record of this part of the walk; and it was not until I arrived at the mountain-wall which encloses the Lac that

I first encountered *E. mnestra*, *E. gorge*, mostly ab. *erynnis*, and what I take to be a small form of *E. glacialis*. The flowery banks that slope towards the water were haunted by *Colias phicomone*, *Nomiades semiargus*, and *B. pales*, and just when the sun went in I took a couple of female *P. eros*, and a male with nicely confluent spots on the under side; while somewhat lower a few fresh *Zygæna achilleæ* flickered among the tall grasses. This was on my first visit. The next day, crossing over the grassy intervening hills golden with hawkweed and arrayed with many bright Alpine flowers besides, I found butterflies scarcer than ever, though I met with a nice form of *H. alveus*, and a single *P. orbitulus*, noting further a fine male *Gonepteryx rhamni* at about 7300 ft. Proceeding on to the rocks in the direction of the Col de St. Martin, and working well up to the snow, nothing better than a battered *E. gorge* or two turned up, and a few *Zygæna minos*. Evidently I had not found the haunts of *E. scipio*, and the locality included under the rather comprehensive style of "Allos."

On the 11th I walked down through picturesque Colmars, with its quaint walled town and mediæval fortifications, to Beauvezer, where I found myself in the Basses-Alpes proper, and after a halt of two days in the admirably arranged Hôtel Alp—in lovely weather which produced nothing novel except females of *E. neoridas*, and exquisite examples of *Zygæna fausta* and *Z. carniolica*, with *P. dorilis* and a stray *P. meleager* var. *steverni* from the lavender-covered hills—I found myself once more at the familiar railway-station of St. André-de-Méouelles. From that day onward, with one black exception, the weather proved all that could be desired, and, though I had intended to pass no more than a few hours at Digne, so agreeable did I find the air of that—in August—usually stuffy town that I remained at the Hôtel Boyer-Mistre for an entire week, still buoyed up with visions of *E. scipio* on the Dourbes, an expedition in the height of summer not to be undertaken lightly, and hitherto shirked completely by me.

My notes for August 14th commence: "In the wonderful 'Eaux Thermales' valley, and wonderful it certainly is to the collector who has the good fortune to be there any time from the first week in April onwards to the autumn, for I have seen it even in October full of insect life, and I suspect that there are few fine days in the year when it would not afford one or other of the continuous brooded *edusa*, or of the butterflies which we regard as hibernators. On this fresh summer morning, throughout that part of the valley from the sudden source of the clear brook to its junction with the Torrent des Eaux-Chaudes—now shrunk to a mere thread of silver water—the whole air is alive with the music of bird and insect, for I have noticed that in the South of Europe the summer silence characteristic of English wood is broken long

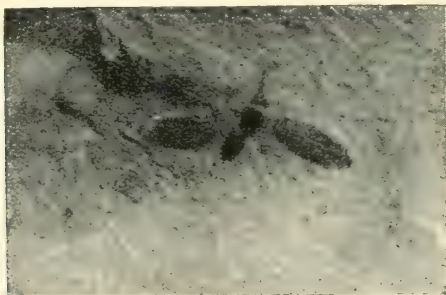
after the spring is over, and the nightingales make music in the willows of the Bléone even to the end of June. Round the tall up-standing thistles there is a battle royal for the purple flower-heads, and it is amusing to see how the pugnacious 'skippers' will put to flight even the monster Argynnis and the heavy lumping *Enodia dryas*, which I have found nowhere in the Basses-Alpes but here. On the warm mud of the riverside a single *Pyrgus proto*, *Carcharodus althææ*, *Hesperia carthami*, and *H. alveus* var. *cirsii* with the bright rusty-red under side dispute with clouds of the beautiful silky-white *P. corydon* of the region. Males of *P. meleager* are also not uncommon; and it must have a prolonged emergence, as I have taken it at Digne in former years as early as June 14th. *P. bellargus* is over for the time being, but *P. hylas* of the second generation is emerging, and tiny males of *P. baton*, no larger than smallest *C. minima*. Some day I fancy the 'forms' of this little butterfly, too, will be separated into species; superficially, at least, the fine mountain *baton* and the *baton* of the Mediterranean coast in March and Digne in August are widely different. Round the willows flit the second brood of *Cyaniris argiolus*, with lovely lilac-winged females, strongly suffused with black; *Rusticus argus* is also in prime condition, with *Chrysophanus virgaureæ* females of surpassing brilliancy and size. *Leptosia sinapis* var. *diniensis* and single *L. duponcheli* represent the autumn emergences, and the second brood of *Melitæa deione*—here unmistakably distinct from all its congeners—is not uncommon, though the males are showing signs of wear already. A fine red *M. parthenie* is also easily identified; but in point of numbers *E. neoridas* is an easy first, with *Epinephele tithonus* crowding the dull pink blossoms of *Eupatorium*, where *C. hera* is also in strong force. What a rainbow cloud of colour streams upward when, in striking at some more than usually attractive specimen, the whole array of banqueters rises in the air! *Limenitis camilla* is in such splendid condition that there can be no doubt of its constituting a second brood; on the opposite bank, in the full glare of the sun, when the white thyme and the gennifer fill the air with sweet perfume, *Gonepteryx cleopatra* is sailing lazily, and the rocks are alive with the warmth-loving Satyrids. Commonest of them are now *Satyrus statilinus* var. *allionia* and *Hipparchia arethusa*—the latter in myriads; *S. actæa* is on the wane, but before the day is over I meet with, for the first time in my experience, the female of *S. fidia*—of all the Satyrids most fair on the under side, and in its protective colouring also the most deceptive. Of *Papilio alexanor*, to whom the valley is consecrated in the memories of many others besides myself, there is no vestige, and that is the one disappointment of the day, though *P. podalirius* and huge *P. machaon* complete the picture. *P. admetus* var. *ripertii* is also looked for in vain, though higher up the valley

on the way to the Coussons the lavender is by no means flowered out, and the spikes are studded with the ruddy orange-red of *Zygæna fausta*, *Z. carniolica* var. *diniensis*, and occasional *Z. transalpina*. *P. meleager*, males, are also flying, and from a flower-head of *Eupatorium* I am presently fortunate enough to take what, at a distance, looks like a female of *C. virgaureæ*, but in the net discloses a female *C. alciphron* var. *gordius* with a somewhat remarkable under side, with the exception of the discoidal spot on the fore wings, the usual maculations being almost entirely absent, as one sometimes sees them in *L. arion*; and in the scheme of marking not altogether unlike the aberrant *cinnus* of *P. bellargus*."

(To be continued.)

A FOSSIL FLY OF THE FAMILY BLEPHAROCERIDÆ.

By T. D. A. COCKERELL.



Philorites johannseni, n. g., n. sp.

In his 'Western Diptera' (1877) Osten Sacken described the Blepharoceridæ as a "remarkable family—remarkable for its exceptional characters; for the paucity of the species, scattered through the most distant parts of the world; and for the variety of generic modifications which these species show in preserving at the same time with wonderful uniformity the very striking family characters, some of which are unique in the whole order of Diptera." These words are equally true to-day, although the number of known species has been somewhat increased. According to Handlirsch ('Die Fossilen Insekten') there are about thirty living forms described, but not a single fossil species. Of the thirteen families of Nematoceros Diptera recognized by Handlirsch, only two, the Blepharoceridæ and the Orphnephilidæ, are without fossil representatives.

That the Blepharoceridæ are not of recent origin is sufficiently manifest from their characters and distribution; hypothetically, Handlirsch supposes them to have arisen as long ago as the Lias. However this may be, it is of much interest to find a representative in the earlier Tertiaries of Colorado, throwing the first actual light on the early history of the group.

The fossil now described is one of a small series of fossil insects kindly loaned to me by Dr. S. M. Bradbury, of Grand Junction, Colorado. The specimens were found a few miles north of Rifle, Colorado, an entirely new locality for fossil insects. They consist of Coleoptera, Diptera, and Hemiptera (but no Hymenoptera), and occur in a sort of close-grained sandstone, varying in colour from dull grey to pale ochraceous or creamy. It is probable that they belong to the Green River Series, but they may be referable to the Wasatch. My colleague Professor R. D. George thinks that the rock looks like Wasatch, but the general facies of the insect-fauna recalls that usually ascribed to the Green River. The age is considered to be Eocene.

When I first examined the specimen, I thought it must belong to the Simuliidæ; but a closer scrutiny indicated that this was impossible. It did not seem to agree well with any described family; and being altogether perplexed, I sent a rough sketch to Professor O. A. Johannsen, of Cornell University. Professor Johannsen replied, suggesting that it might be referred to the Blepharoceridæ, and advising comparison with *Apistomyia* and *Hammatorhina*. With this clue I re-examined the fossil, and had little difficulty in determining that it was indeed a Blepharocerid. I found, also, that my original sketch was faulty in several respects, and, so far as I could ascertain, the affinities of the insect were with *Bibiocephala* and *Phylorus*, although it evidently represented a very distinct genus. Kellogg (Proc. Calif. Acad. Sci., 1903) has divided the Blepharoceridæ into two series, one with, the other without, an incomplete vein (branch of the media) near the posterior margin of the wing. The incomplete vein is present in all of the living North American forms, and is absent principally in the tropical genera. Owing to the conditions of preservation I am not able to quite clearly demonstrate this vein in the fossil, but I believe I can see it, and the probability of its existence is increased by the wide interval between the media and the cubitus, apparently needing such a support.

From all of the genera in the section having the incomplete vein the fossil is distinguished by the large costal cell, the position of the radiomedial cross-nervure, the long proboscis, and the short legs.

Philorites johannseni, n. g., n. sp.

Length, without proboscis, about 4 mm.; expanse about 9 mm.; head and thorax black; legs brown; wings ample, strongly fuliginous, the basal third of the costal region pale; proboscis stout, about 2 mm. long; palpi large, as usual, the apical portion slender, the tips falling nearly $850\ \mu$ short of tip of proboscis (*Apistomyia* has a long proboscis; *Paltostoma*, which has an exceedingly long proboscis, has rudimentary palpi); antennæ filiform, apparently normal, not especially short (full length uncertain, but over $1360\ \mu$); eyes apparently prominent, but ill-preserved; a distinct dark V at base of hypopharynx (compare Kellogg's figure of *Bibiocephala elegantula*); thorax arched; abdomen short and broad (width about $1020\ \mu$), approximately parallel-sided; hind femora short, failing by more than $510\ \mu$ to reach level of apex of abdomen; tibiæ and tarsi slender, fairly long.

Radius, except of course apically, distant from costa, leaving a large costal cell, which is about $238\ \mu$ deep (this is much more like *Bibiocephala* than *Philorus*); vein R_{2+3} (following the nomenclature used by Kellogg) very weak, arising from R_{4+5} (which is strong) about $460\ \mu$ beyond origin of latter from R_1 , and branching about $646\ \mu$ from its origin, the branches running approximately parallel, to end about the apex of the wing, the branching being at least $2200\ \mu$ from the latter point; R_{4+5} ending (as in *Bibiocephala comstocki*) below the apex of the wing; radiomedial cross-nervure weak, but apparently at right angles to radius and media, and about $780\ \mu$ beyond mediocubital cross-nervure, and $1462\ \mu$ from margin of wing, measuring along media; cubitus with two branches, as usual, the lower branch conspicuously bent at the cross-nervure; anal weak, only partly visible. The vein R_{4+5} is not bent at the origin of R_{2+3} , or at the radiomedial cross-nervure.

In the table of Blepharoceridæ, *Philorites* will come in as follows:—

No incomplete branch of media	<i>Apistomyia</i> , <i>Hammatorhina</i> , <i>Paltostoma</i> , <i>Sackeniella</i> , <i>Curupira</i> , and <i>Hapalothrix</i> .
With an incomplete branch of media	1.
1. Radius $_2$ wholly fused with radius $_3$	<i>Philorus</i> and <i>Blepharocera</i> .
Radius $_2$ at least partly distinct	2.
2. Proboscis shorter than palpi	<i>Bibiocephala</i> .
Proboscis longer than palpi	<i>Philorites</i> .

In the venation, *Philorites* represents a more primitive condition of the branches of the radius than is seen in *Bibiocephala grandis*, the most primitive member (so far as the radius goes) of the living American species. The arrangement is, in fact, not very unlike that of *Dixa* and the Culicidæ.*

A few species of Blepharoceridæ exist to-day in the Rocky

* It is of interest to note that the Blepharoceridæ and Culicidæ agree in possessing the peculiar number of five (instead of four) Malpighian-tubes.

Mountains region. I have taken *Bibiocephala grandis*, Osten Sacken, flying over the River Pecos at Pecos, New Mexico.

The accompanying figure of *Philorites* is from a photograph kindly made by Mr. W. W. Robbins, slightly touched up with India ink.

CURRENT NOTES.

BY G. W. KIRKALDY.

1. HENDEL, F.: "Diptera—Fam. Muscaridæ, Subfam. Lauxaninæ," 'Genera Insectorum,' fasc. 68, pp. 1-66, pls. 1-3 (1908).
2. HORVÁTH, G.: "Les relations entre les faunes hémiptérologiques de l'Europe et de l'Amérique du Nord," Ann. Mus. Hung. vi. 1-14 (1908).
3. KERTÉSZ, C.: "Catalogus Dipterorum hucusque descriptorum," iii. 1-367 + i (1908).
4. LONGSTAFF, G. B.: "Notes on some Butterflies taken in Jamaica," T. E. S. London for 1908, pp. 37-51, with map (June 5th, 1908).
5. MARTELLI, G.: "Contribuzioni alla biologi della *Pieris brassicæ*, L.," Boll. Lab. Zool. Portici, i. 170-224, figs. 1-12 (May 30th, 1907; Lepidoptera).
6. MARTELLI, SILVESTRI, and others: "Contribuzioni alla conoscenza degli insetti dannosi all'olivo e di quelli che con essi hanno rapporti," *op. cit.*, ii. 1-358, 187 figures (1907-8).
7. MASSI, L.: "Contribuzioni alla conoscenza dei Calcididi italiani," *op. cit.*, i. 231-95, figs. 1-47 (Nov. 29th, 1907; Hymenoptera).
8. Proceedings of the Hawaiian Entomological Society, vol. i. pp. 1-210, pls. 1-4, with 11 text-figs. (1906-8).
9. ROCCI, U.: "Contribuzione allo studio dei Lepidotteri del Piemonte," Bull. Soc. Ent. Ital. xxxviii. 52-79 (June 1st, 1907).
10. THEOBALD, F. V.: "A Monograph of the Culicidæ," vol. iv. pp. i-xix and 1-639, text-figs. 1-297, pls. i-xvi (1907; Diptera).
11. VERITY, R.: "Elenco dei Lepidotteri della Vallombrosa (Appenino Toscano) (800-900 metri)," Bull. Soc. Ent. Ital. xxxviii. 20-51 (June 1st, 1907).
12. VICKERY, R. A.: "A Comparative Study of the External Anatomy of Plant Lice," Rep. Ent. Minnesota, xii. 1-16, figs. 1-5 (May, 1908; Hemiptera).
13. WELLMAN, CR.: "Bionomische Beobachtungen an *Phoner-gates bicoloripes*, Stål" (July 1st, 1907; Hemiptera).

14. HORN, W.: "Brullé's '*Odontochila* aus dem baltischen Bernstein' und die Phylogenie der Cicindeliden" (Sept. 1st, 1907; Coleoptera).

Horn (14) divides the subfam. Cicindelinae (of the fam. Carabidae) into two phyla, viz., Alocosternaliae (with tribes Ctenostomini and Collyrini) and Platysternaliae (with tribes Cicindelini, Megacephalini, and Mantichorini).

Martelli (5) gives a very full account of the biology of the "large cabbage white," with that of its parasites, hyperparasites, &c. Verity (11) enumerates 456 species of Lepidoptera from Vallombrosa in the Tuscan Apennines, viz.: 77 Rhopalocera, 255 Macro-Heterocera, and 124 Micros. The list is annotated. Rocci (9) deals only with the butterflies of Piedmont, of which he enumerates 117; this list is also annotated, and is preceded by observations on the country. Longstaff (4) precedes his notes on Jamaican butterflies by topographical remarks and a map of the island.

Massi (7) presents an extensive and well illustrated contribution to the study of the chalcid flies.

Horváth (2) has summarized the interesting relations between the Hemiptera of Europe and North America. Thirty-three species—*Reduvius personatus*, *Clinocoris lectularius*, two Chermidae, twelve Aphidae, and seventeen Coccidae—are common to both. The summary is as follows:—There exist a certain number of species and genera of Hemiptera common to Europe and North America. The great majority of these Hemiptera has originated in the palæarctic fauna, and belongs to the temperate zone. Their migration has mostly taken place by the Behring Strait. The few southern types common to the two continents have originated from intertropical regions, whence they have independently come to enrich the palæarctic and nearctic faunas. Artificial importation plays only a secondary rôle in the propagation of Europeo-American Hemiptera, but Europe has, by means of its cultivated plants, added more species to the American fauna than *vice versa*.

Vickery's notes (12) on the external anatomy of Aphidae may be interesting to British workers. Wellman (13) furnishes some biologic notes on an African Reduviid bug, which preys on a hut-infesting tick (*Ornithodoros*).

Silvestri and his assistants (6) have issued a very important work on the insects injurious to the olive. All orders are discussed very fully as regards their biology and anatomy.

Theobald (10) has issued a fourth volume on Mosquitoes, extending to over six hundred pages; he describes seventy-three new species. Hendel's "Genera" of the Lauxaninae (better known as Sapromyzidae) is somewhat extensive, and will doubtless be very valuable to dipterists. The three coloured plates

are well executed (1). The third volume of Kertész's general catalogue of Diptera will be very welcome (3). It lists the species described up to the end of 1905, and embraces the Stratiomyiidae, Erinnidae, Ctenomyiidae, Tabanidae, Pantophthalmidae, and Rhagionidae.

The Hawaiian Entomological Society (8) have completed their first volume of Proceedings, in which all orders are discussed. This is the only entomological society outside Europe and North America to publish proceedings.

THE ATHALIA GROUP OF THE GENUS MELITÆA.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 249.)

PALPI.

Deione.—From above: Tip black, bare, and claw-like; orange-brown hairs on top and sides to two-thirds of length; pale hairs showing below the orange-brown.

From below: Black, nearly covered with pale hairs to two-thirds or three-quarters of the length; orange-brown hairs almost to the tip.

Athalia.—From above: Black, so sparingly clothed in the upper portion with orange-brown hairs as to leave the general appearance quite dark.

From below: Black, but thickly covered with pale hairs till near the tip, where they become orange brown. The shade of the pale hairs varies greatly, from almost white to a light orange-brown.

Parthenie.—From above: Black, but so densely covered with orange-brown hairs that the general effect is orange-brown.

From below: Black, with pale hairs to about half the length, not very dense, and thence orange-brown to the tip.

Varia.—From above: Very densely clothed, as in *parthenie*, but with hair so much darker that they appear almost as dark as in *athalia*, though from an opposite cause.

From below: Black, clothed throughout in the male with orange-brown hair, but in the female the hair near the base is pale.

Aurelia.—From above: Black, less thickly clothed than in *parthenie*, with hair of a darker shade, as in *varia*. The general effect is considerably darker than in *parthenie*.

From below: Black, with darkish orange-brown hair, and some pale hairs at the base in the female, but not in the male. The palpi of *aurelia* and *varia* have the closest resemblance of any.

Britomartis.—From above: Black, very sparingly clothed, even in the freshest examples, with very dark orange-brown hair. The palpi are short.

From below: Black, clothed to the tip with short pale hairs, giving the effect of a black streak between two nearly white lines.

Dictynna.—From above: Black, fairly well clothed with darkish orange-brown hairs.

From below: Black or nearly black, with orange-brown hairs up the centre, and lighter, sometimes quite light, ones at the sides; the light hairs not reaching to the tip.

Asteria.—Short. From above: Black, very thickly clothed with dark brown hair.

From below: The same, with a few pale hairs on the inner side of the base in the male, and on both sides of the base and further up the inner side in the female.

ANTENNÆ.

Deione.—Black above, orange below, the orange being extended over the tip on to the upper side. Each joint is edged with white, which sometimes makes a white line between the black and the orange. The depth of the orange colour varies greatly.

Athalia.—Black above, the joints barely outlined in white; whitish below, becoming yellow-brown towards the tip, this colour only very slightly turning over on to the upper side. The whitish coloured portion is much narrower than the orange in *deione*. Occasionally the yellow-brown extends almost to the base of the antennæ.

Parthenie.—Brownish black above, the joints as conspicuously edged with white as in *deione*, making the dark line narrow; orange-brown below, much darker than in *athalia* or *deione*, this colour only very slightly, often not at all, turning over the dark side of the tip.

Varia.—Much less conspicuously edged with white than in *parthenie*, especially in the male, and even darker below; a small white patch at one side of the tip.

Aurelia.—Dark brown above, with white edge; a large white patch at the side of the tip. Darker even than *varia* below, but lighter orange-brown, though still dark, towards the tip. This colour, even when showing on the upper side, does not look as if it were folded over from below.

Britomartis.—Very like *athalia*, but the under surface lighter, frequently white, and the white runs right up into the tip, which is edged with orange-brown.

Dictynna.—Black above, distinctly ringed with white; pale yellow or nearly white below, the white sometimes running up almost to the end of the tip, which is red-brown or orange-brown, this colour showing also on the upper side of the tip.

Asteria.—Black throughout above, the joints slightly and occasionally strongly indicated with white at the edge; below, black or very dark brown, occasionally with white near the base and at the side of the tip, rarely showing any orange-brown at the tip.

There are still three other considerations to be taken into account with regard to the perfect insect, even apart from neuration and the male armature, namely, size, locality, and date. Of these the first, though of some slight general value, is quite useless in any doubtful case apart from the other two. In the cases especially of *athalia* and *dictynna*, the variation in size,

though both may be regarded as single-brooded, is very great. In *deione* the difference between the two broods is often considerable, and in *britomartis*—at least as represented at Reazzino—it is most striking. In *parthenie* (apart from *varia*, which, so far as I see at present, there is no reason for connecting with it) the difference in size between the two broods is not, in my experience, considerable, but I have seen no specimens that are undoubtedly North German of the second brood (the mere label “Germania” being almost worse than useless); so that, in the face of Borkhausen’s description and Godart’s illustration, it would be unreasonable to make a general statement to this effect. Speaking somewhat loosely, it may be said that *asteria* is the smallest species, then *varia*, and that *aurelia*, *britomartis*, *parthenie*, *athalia*, *deione*, and *dictynna* follow in this order; but this must in no sense be taken as a rule, except in so far as that if hundreds of examples of all the species were measured, the average would probably come out in that order; but in individual cases the exceptions would be so multitudinous that size alone is most untrustworthy as a guide. Speaking generally, it may be said that in any given species the longer the feeding-time of the larva the larger the resulting imago (though even this must be qualified by taking into consideration the nutritive qualities of the food attainable), and hence it follows that in double-brooded species of this genus, the spring brood, whose larvæ feed both in autumn and spring, is generally larger than the autumn brood, which has to get through all its phases in two or three months, or even less. This is strikingly illustrated by the cases of *parthenie*, *berisalensis*, and *britomartis* in Switzerland. There is little difference between the two broods of the first-named species, the second brood of which begins to feed when the plantains are still fairly young and juicy, and which has about ten weeks of larval life; the difference is greater in *berisalensis*, the first brood of which does not generally appear till two or sometimes even three weeks later than *parthenie*, the second broods being nearly contemporary; whilst in *britomartis*, the larval life of whose second brood cannot extend beyond five weeks at most, the difference is very great, the first brood being generally as large as the average *parthenie*, and the second sometimes as small as the smallest *asteria*. When *aurelia* is partially double-brooded, south of the Alps, as at Roveredo, the few second-brood specimens that I have found have been no larger than *asteria*, and the small size of September *athalia*, when that species ventures on a partial second brood, is a matter of common knowledge. It follows also from this that the higher the altitude to which a single-brooded species mounts, the smaller will the specimens become, whereas, if a double-brooded species mounts high enough to become single-brooded, the tendency of the specimens will be towards increase in size,

until it arrives at an elevation which, by giving a shortened time for the growth of the larva by the late melting of the snows, or by decreasing its nourishment by stunting the food-plant, again dwarfs the species down to, or below, the average of the plains.

(To be continued.)

A SMALL COLLECTION OF SWISS NEUROPTERA.

By W. J. LUCAS, B.A., F.E.S.

WITH his usual kindness Dr. Chapman handed over to me the Neuroptera he took in Switzerland in July and August of the past summer. Though few in number there were amongst them representatives of four of the neuropterous suborders.

PERLIDIA.—*Dictyopteryx alpina*, two specimens, Saas-Fée, 19th to 31st July.

ODONATA.—*Sympetrum striolatum*, one female, Zermatt, 9th to 16th August. *S. fonscolombii*, three males, Zermatt, 9th to 16th August.

PLANIPENNIA.—*Panorpa vulgaris*, one female, Glion, 2nd to 5th July; also one male and three females, Vissoye, 7th to 17th July; *P. vulgaris*, which is common in Switzerland, is structurally only a form of our *P. communis*. *Ascalaphus coccajus*, two females, Saas-Fée, 19th to 31st July.

TRICHOPTERA.—*Drusus nigrescens*, one, Saas-Fée, 19th to 31st July. *Sericostoma pædemontanum*, one, Saas-Fée, 19th to 31st July.

Mr. K. J. Morton kindly assisted with some of the identifications. But one species, *Sympetrum striolatum*, is represented in Britain.

NOTES AND OBSERVATIONS.

RHODOMETRA (STERRHA) SACRARIA IN SOUTH DEVON.—The specimen recorded by Mr. H. M. Edelsten (*antea* p. 250) is a male and not a female, as there stated. The mistake arose in the press.

ANGERONA PRUNARIA IN SEPTEMBER.—One individual of a brood of eighty larvæ, reared from eggs laid by a bred female in early June last, became full grown and spun up about September 15th. A female moth emerged on September 28th. All the other larvæ remain of the normal size for the time of year, and will no doubt hibernate in due course.—J. B. MORRIS; 14, Ranelagh Avenue, Barnes.

NONAGRIA NEURICA IN BRITAIN.—During July we captured in Sussex a *Nonagria* which we at first believed to be *arundineta* and recorded as such in August 'Entomologist,' but upon a closer examination, not finding the specimens to agree with those from Kent, Cambs, and Norfolk, we sent them to Mr. Edelsten, who replies

"that the specimens agree with the insect known on the Continent as *N. neurica*, Hb., a species which is quite distinct from *N. dissoluta* and its var. *arundineta*. *N. neurica*, Hb., occurs in parts of Germany, &c., but this is apparently the first occurrence of this insect in Britain."—E. P. SHARP & A. J. WIGHTMAN; Lewes.

LATE EMERGENCE OF *ÆSCHNA CYANEA*.—I have to record another late emergence of a dragonfly. An *Æschna cyanea* emerged early in the morning of September 7th. Of many bred this summer the earliest came out on June 13th; there was then an interval of a fortnight. After that they appeared in rapid succession until about the end of the first week in August. No more came out after then till that late lingerer on September 7th, born entirely out of due season. HAROLD HODGE; 322, Oxford Street, W., October, 1908.

NOTE ON *ABRAXAS SYLVATA*, AB.—I was struck with the general resemblance of the aberration of *A. sylvata* (*ulmata*) figured in the last number of the 'Entomologist,' its blurring and suffusion, to the appearance presented by some geometrid moths whose pupæ have been exposed to abnormally low temperatures. This led me to find what temperature the specimen taken by Mr. Scollick, as you inform me, on the 22nd June, 1907, must have been subjected to while in the latter part of its pupal stage. I have access to the Brighton official temperatures and find that the June of 1907 was the coldest certainly for thirteen years. May was also considerably below the average, especially the last half of it. In Buckinghamshire, where the specimen figured was taken, the temperature was probably lower, that being an inland county. Different species vary greatly in their sensitiveness, so far as it is exemplified by their facies, to pupal cold; I do not know how *sylvata* ranks in this respect, and a species which, like this, has a winter pupa, is usually less sensitive than one which has come from a summer pupa, so that I by no means put forward the theory that the cold May and June of 1907 were the cause of the abnormal appearance figured—only there seems a possibility of it. F. MERRIFIELD; 14, Clifton Terrace, Brighton.

EUPITHECIA LARVÆ ON *PASTINACA*: A CORRECTION. — Mr. Percy C. Reid informs me that the larvæ which he found on *Pastinaca sativa*, and took to be those of *Eupithecia pimpinellata* (Ent. Rec. xx. 13; Entom. xli. 54) proved to be *E. scabiosata*, well known to be a pretty general feeder, though I do not at the moment remember that parsnip has hitherto been recorded as one of its food-plants.—LOUIS B. PROUT; 246, Richmond Road, N.E., October 26th, 1908.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA IN CORNWALL.—I have not seen so many *Colias edusa* for very many years as I saw during the first ten or twelve days of this month flying over the towans, both on the Lelant and the Hayle side of the estuary of the Hayle river. I was in this part, on and off, from September 8th until October 12th, but I did not see a single *C. edusa* until October. Generally, I noticed more insects, in-

cluding *Macroglossa stellatarum* and *Pyrameis cardui* for the first time this season, in the first weeks of October, than in the whole summer previously. In fact this seemed to be the true summer. HAROLD HODGE; October 19th, 1908.

COLIAS EDUSA AT LEATHERHEAD, SURREY.—A neighbour of mine brought me yesterday a male *C. edusa* he had caught with his hat in a field here. Needless to say it was very worn.—JOSEPH H. CARPENTER; Redcot, Belmont Road, Leatherhead, October 4th, 1908.

ACHERONTIA ATROPOS AT RINGWOOD.—A fine perfect male specimen of this hawk-moth was brought to me on the 10th inst. by a lad who had found it in his father's garden.—CHAS. J. BELLAMY; Broadshard Cottage, Ringwood, October 11th, 1908.

ACHERONTIA ATROPOS IN INVERNESS-SHIRE.—Mr. Grant, Drumalan, Drumnadrochit, has sent me a specimen of *Acherontia atropos*, which was picked up on the road in the village of Milton, near Drumnadrochit, on September 28th. It was dead when found. The specimen is a large one.—HENRY H. BROWN; Cupar-Fife.

ACHERONTIA ATROPOS IN MIDDLESEX.—Mr. Broughton Edge, the Revising Barrister for the Hammersmith district, informs me that a specimen of this moth, taken in the neighbourhood, was brought into his Court during the September sittings, and shown him by the captor.—H. ROWLAND-BROWN; Harrow-Weald, October 24th, 1908.

SPHINX CONVULVULI AND ACHERONTIA ATROPOS IN SELKIRK.—A specimen of each of these noteworthy moths was brought to me yesterday, both having been caught in the town. *S. convolvuli* was found behind a rain-pipe on the ground. It had lost a fore-leg, but was otherwise in good condition and lively. *A. atropos* was found creeping up a chimney-stack. It had been handled a good deal before I got it, and was somewhat worn.—B. WEDDELL; Selkirk, October 23rd, 1908.

PYGERA ANACHORETA, &c., IN ESSEX.—Referring to Mr. George P. Kitchener's note in last month's 'Entomologist,' on capturing a female *P. anachoreta* in Essex, I would like to call attention to an error on his part in saying the only records he can find of former captures have been on the Kentish coast, as my find of wild ova of this species at St. Leonards-on-Sea, Sussex, in August, 1893, was duly recorded in the 'Entomologist' after the larvæ had pupated. I may mention that this brood was kept up by myself and friends for nine years, when it became exhausted.—Miss A. D. EDWARDS; The Homestead, Coombe Hill, East Grinstead, October 17th, 1908.

CARADRINA EXIGUA AT CHESTER.—A specimen of *C. exigua*, in fine condition, rewarded my search at the foot of the electric lamps on the night of October 12th. This species was first recorded at Chester by Dr. Herbert Dobie, who took a specimen at the electric lamps in 1900. The second record fell to my share, September 25th, 1903.—J. ARKLE; Chester.

DASYPOLIA TEMPLI AT CHESTER.—I took a fine male at rest on the city wall near an electric lamp, October 6th, 11 p.m. This makes

my third capture of the species at the Chester electric lights. J. ARKLE; Chester.

LABIA MINOR IN THE CITY. — A male example of this earwig settled on my hand in London as I was walking along Southwark Street near Blackfriars Bridge on Wednesday, September 30th last. Mr. W. J. Lucas was good enough to name it for me and I have added it to his collection, the interest attaching to it being the locality in which it was taken.—F. M. DYKE, B.Sc., Kingston-on-Thames.

CAPTURES OF LEPIDOPTERA IN WEST CORNWALL, 1908. — Of *Leucania albipuncta* I have this season taken three specimens, two in grand condition and one slightly worn; and of *Apamea leucostigma* (*fibrosa*) a single specimen in very good condition. I believe these to be the first published records for this county. Half a dozen very fine *Leucania vitellina* and several fine *Polia xanthomista* = *nigrocincta* have also been secured. *Colias edusa* has been scarce, but I have captured five or six specimens, and have seen about two dozen others. Two other insects perhaps worth mentioning are *Sphinx convolvuli* and *Acherontia atropos*, of each of which I have obtained one example.—W. A. ROLLASON; Lamorna, Truro, Cornwall, October 17th, 1908.

ZIZERA (CUPIDO) MINIMA IN AUGUST.—During the first week in August the second brood of *Z. minima* was locally common on Salisbury Plain.—F. W. J. JACKSON; Woodcote End House, Epsom.

NOCTUA DITRAPEZIUM A SCOTCH SPECIES.—A very fine specimen of this moth was taken at sugar at Fortrose, in the Black Isle, in August, 1903. I was not aware until a few days ago that this species has not hitherto been regarded as extending its range so far north. I certainly have never taken it in Scotland since, nor can I learn from friends north of the Tweed of any other Scotch record. The only books of reference that I have at hand limit its distribution to England.—R. MELDOLA; Lyme Regis, September 15th, 1908.

[Since writing the above I find that Barrett gives Moncrieff Hill, Perthshire, among the localities for this species. Its occurrence at Fortrose on the shore of the Moray Firth is, however, worthy of record.—R. M.]

NOTES ON COLLECTING IN THE ALDERSHOT DISTRICT.—To most people the word Aldershot conjures up visions of soldiers and field days over the Long Valley rather than of entomological expeditions. The Long Valley truly is a terrible place, where not even a cabbage white nor a meadow brown can keep up the struggle for existence. On that desolate sandy waste I would be more surprised to see a butterfly than a vulture, for on a broiling hot day the valley reminds one of a tropical desert, and it would only require the vulture to complete the resemblance. Luckily, however, the Long Valley is of limited extent, and all around it lie districts that are more favoured entomologically than any others that I know of, except perhaps Dover. Taking Aldershot as a centre, and using a bicycle as a means of conveyance, five distinct types of country can be reached in an

easy day's excursion, *viz.*, miles of fir woods, acres of heather land, extensive oak woods, chalk hills, and the ordinary field and hedgerow country. All these districts produce their own peculiar fauna in abundance. I have only been one year in Aldershot, and during that time I have really had very little leisure for entomological expeditions. Modern soldiering at Aldershot requires that one shall devote all one's time and energy to it. On the other hand, when carrying out military training one traverses a large expanse of country, and lines of troops in extended order will make almost any insect move out of heather and woods. My experience, therefore, of the lepidopterous fauna of the Aldershot district has been more that of observing than collecting. I cannot collect numbers of any insect, as it would not be possible for me to carry cabinets all over the world, and also I am very much against the practice of collecting "series." I often read with dismay in the 'Entomologist' how So-and-so caught "a nice series" of some dozens of a rare insect. Soon half the butterflies and moths of the British Isles will become extinct if collectors go on amassing "series." One wonders why the various entomological societies do not protest against this type of wholesale slaughter. But I must return to the butterflies and moths that I have come across whilst riding about, and which have come to the sugar patches which I always keep going in my garden.

Of butterflies I have met with thirty-six species. Six other species, including *Apatura iris*, occur occasionally, I have heard, and I hope to obtain them next season. Of those species that I myself saw, *Argynnis paphia* swarmed in some woods, *A. selene* and *A. euphrosyne* were fairly common, and *A. aglaja*, also *A. adippe*, were met with. *Limenitis sibylla* was very numerous. One day whilst riding through a wood I counted four white admirals on one small blackberry bush. I also came across this insect, quite close to Aldershot town, engaged in the rather peculiar pursuit, for it, of sailing about in glaring sunshine over a small pond, occasionally resting on the water-lily leaves. The pond was of course in a wood. *Satyrus semele* swarms everywhere, and *Epinephele tithonus* is equally common. *Zephyrus quercus* was plentiful in all oak woods, and *Lycæna astrarche*, *L. corydon*, *Cupido minima*, and *Cyaniris argiolus* all occurred freely in the right spots.

The list of moths noticed would be too long to enumerate. All the commoner species seem to abound, and no doubt, had I the time available in which to work the district systematically and breed larvæ, I could obtain all the Macro-Lepidoptera, except those species which are peculiar to the north, the fens, or the coast. Of local or rare species I have come across the following:—*Hemaris bombylifformis*, *Hylophila bicolorana*, *Nola confusalis*, *Cochilidon limacodes*, *Drepana binaria*, *P. dictæoides*, *Acronycta leporina*, *Nonagria typhæ*, *Apamea unanimitis*, *A. ophiogramma*, *Plusia moneta*, *Erastia fuscula*, *Hadena geniste*, *Calymnia pyralina*, *Aporophila nigra*, *Agrotis vestigialis*, *Orrhodia rubiginea*, *Xylina semibrunnea*, *Epione apiciaria*, *M. unangulata*, *Anticlea rubidata*, *Coremia quadrifasciaria*, *Boarmia consortaria*, *Tephrosia extersaria*, and *Collix sparsata*. Of these *C. pyralina* seems to have its headquarters in my orchard. If I were a "series" collector, I could have taken a couple of dozen this

summer. I bred one from a caterpillar I found on a pear-tree. *Aporophila nigra* and *Agrotis saucia* have been very common. *B. consortaria* and *D. hamula* came to sugar in the garden. *P. dictæoides* I have found on tree-trunks. *Agrotis vestigialis* is really a coast insect, but I found a fine dark specimen one day inside a tent on one of the heather districts.

During the latter part of August, searchlight operations were carried on on the Chobham Ridge. Now this ridge is a heather and fir-tree clad hill some three miles long, whence a view can be obtained from Sunningdale on the north to Guildford on the south, and beyond Weybridge towards Croydon on the east. No light was turned on until 9.30 p.m. My duties happened to bring me alongside one of the searchlights, one using a fixed beam. The sight was so extraordinary that even the men working the lights made remarks upon it. From every side dozens of moths came sailing into the light area. At a short distance off they all appeared white, just like a number of swiftly moving snowflakes. Few, however, came directly towards the light, and fewer still gave me any opportunity to discover the species they belonged to. Of those, however, that I could identify, the majority of the Geometers were *P. hippocastanaria*; whilst the Noctuas were either *A. tritici*, *A. obelisca*, or *A. agathina*, but which I could not be certain about, as I had no means of capturing or killing any to enable me to examine them closely. It was decidedly a night of lost opportunities. Once before in my life have I experienced a similar disappointment, and that was during the South African war when I found myself after a night march at the outlying portions of the N'Gome Forest on the Zululand border, where the air seemed to be alive with various species of *Papilio* and *Charaxes*, none of which I could catch, as a butterfly-net and a large killing-bottle are not part of the outfit of an officer in the Mounted Infantry!—B. TULLOCH (Captain, King's Own Yorkshire Light Infantry): Aldershot, October 12th, 1908.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 7th, 1908.*—Mr. C. O. Waterhouse, President, in the chair. Mr. James J. Joicey, of 62, Finchley Road, London, N.W., and Mr. Robt. M. Prideaux, of Woodlands, Brasted Chart, Sevenoaks, were elected Fellows of the Society.—Mr. W. G. Sheldon brought for exhibition a case containing butterflies from Andalusia taken in the spring of this year, as described in the 'Entomologist, with the striking aberration of *Melanargia ines*, showing a strong melanic tendency.—Dr. Herbert Charles showed a remarkable aberration of *Dryas paphia* taken by him in the New Forest in July last. With the exception of the borders and the bars all the wings were suffused with deep velvety brown triangular patches, the maculations being entirely absorbed therein.—Mr. Hugh Main showed living larvæ of *Blatta germanica* to illustrate their colourless condition on first emergence.—Mr. H. St. J. Donisthorpe exhibited examples of (a) *Agrius biguttatus*, F.,

taken in Sherwood Forest, July, 1908, being the first record for the Midlands; (b) *Pyropterus affinis*, not uncommon in Sherwood Forest, July, 1908; (c) a species of *Phora*, with pupæ bred from larvæ which came out of the body of a *Clerus formicarius* taken alive in Sherwood Forest, July, 1908, with the *Agrius*, and probably parasitic on it; (d) *Trogolinus anglicanus*, Shp., a specimen taken at Bembridge, August 3rd, 1908, with a specimen from Plymouth, and only known before to occur in New Zealand, and at Plymouth where it was discovered by Mr. Keys; (e) *Phyto melanocephala*, Mg., bred from woodlice taken at Bembridge, Isle of Wight, August, 1908, with pupa, and a wood-louse with dipterous pupa *in situ*. The life-history of the fly was hitherto unknown, though the larvæ of *Rhinophora atramentaria*, Mg., a nearly related species, have been recorded as parasitic on *Oniscus asellus*.—Mr. A. H. Harrison, a gynandromorphous example of *Pieris napi*, bred from parents taken in North Cornwall this year.—Mr. E. R. Speyer, a case of rare and interesting dragonflies taken in the British Isles in 1908, including (a) *Sympetrum fonscolombii*, Selys. A male and female, taken in Hertfordshire on June 24th and July 27th respectively, the last specimens of this dragonfly recorded from the British Isles being those taken by Mr. Briggs in Surrey in 1892; (b) *Somatochlora metallica*, Lind., a male captured in Sussex on August 4th, being the first authentic record of this insect in England; (c) *Anax imperator*, Leach, a male caught in Hertfordshire with *Libellula depressa*, male, in its jaws; (d) *Libellula depressa*, Linn., two females taken late in the season, showing the appearance of blue powder on the abdomen; (e) *Libellula quadrimaculata*, Linn., four specimens, showing the remarkable difference in the amount of suffusion on the wings in individuals from the same locality, together with the following insects:—*Orthetrum cancellatum*, McLach., male and female, from Herts; *Cordulia ænea*, Linn., male, from Burnham Beeches, Bucks; *Brachytron pratense*, Müll., male and female, from Oxford; *Platynemis pennipes*, Pall., male and female var. *lactea*, from Oxford; *Erythromma najas*, Hansem; specimens from Herts, Bucks, Sussex; and *Pyrhosoma tenellum*, McLach., male and female, from Sussex.—Mr. H. M. Edelsten showed specimens of *Æschna isosceles* and *Libellula fulva* from Norfolk Broads, taken in June last, and *Orthetrum cærulescens* from Chagford, taken in July.—Mr. Norman Joy exhibited a number of examples of Coleoptera new to the British list, including *Oxypoda perplexa*, Muls., from Cornwall; *Sunius lyonessius*, Joy, and *Cryptophagus hirtulus*, Kr., from the Scilly Isles; *Anisotoma flavicornis* Bris., and *Corticaria linearis*, Payk., from Bradfield.—Mr. W. J. Lucas exhibited a spike of the grass *Molinia cærulea* with dead Syrphids, *Melanostoma scalare*, Fabr., attacked by the parasitic fungus *Empusa muscæ*, found on Esher Common, October 3rd, 1908. Most were attached by the point of the head only in a very peculiar manner, and apparently all were females.—Mr. O. E. Janson exhibited a specimen of *Cryptomorpha desjardinsi*, Guér., found by Mr. F. C. Selous in his house at Barton-on-Sea, Hants, on June 26th. This beetle is recorded as living on banana-plants in Mauritius and Madeira, and may have been introduced here with the banana-fruit.—Mr. G. C. Champion, on behalf of Mr. W. West, who was present as a visitor, exhibited

specimens of the following insects:—*Aleochara crassiuscula*, Sahlb., taken at Great Yarmouth in May, 1908; varieties of *Donacia dentipes* and *D. simplex*, from Caistor Marshes; *Nabis boops*, Schiödte, taken at Esher, in August, 1908; and *Idiocerus scurra*, Germ., taken at Blackheath, Kent, in September, 1908.—Mr. L. W. Newman brought for exhibition specimens of (a) *Crymodes exilis* from the Shetlands, including the rare female; (b) *Callimorpha dominula*, two yellow aberrations bred from East Kent ova. In 1906 a yellow female was bred. This was paired with a typical red male, and the result in 1907 was that the whole brood were typical Reds. These Reds were paired, and in 1908 the brood (a small one) produced 25 per cent. of the yellow form; (c) a varied series of *Camptogramma fluviata* from Eastbourne; and (d) a yellow aberration of *Noctua rubi*, from Yorkshire.—Dr. F. A. Dixey exhibited a number of Central and South American butterflies belonging to six different subfamilies, but all showing the same obvious character of a diagonal reddish band on a general dark surface. He stated, in reference to some remarks made by Mr. W. J. Kaye on a previous occasion, that although there was no direct geographical continuity between the areas of distribution of several of the species shown, there appeared to be sufficient connection of an indirect kind to warrant the supposition that the whole constituted an assemblage of mimetic character. The following papers were read or communicated:—"Bionomics of Butterflies," by Dr. G. B. Longstaff, D.M. "Some Additions to the Perlidæ, Neuroptera-Planipennia and Trichoptera of New Zealand," by L. J. Hare, F.E.S. "On the Larvæ of *Hamanumida dædalus*, Fab., *Hoplitis phyllocampa*, n. sp., and *Sulophonotus myrmeleon*, Feld, with Descriptions of the Imagines of the two Heterocera," by Roland Trimen, F.R.S. "A Revision of the Australian and Tasmanian Malacodermidæ," by A. M. Lea, F.E.S., Government Entomologist, Tasmania.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 10th, 1908.—Mr. Alfred Sich, F.E.S., President, in the chair.—Messrs. Harrison and Main exhibited a series of bred *Macaria liturata* var. *nigrofulvata* from Delamere ova. Of the fourteen specimens bred, thirteen were of the dark form.—Mr. Newman, varieties of *Abraxas grossulariata*, including ab. *varleyata*, ab. *nigrosparsata*, dark forms, and a rayed specimen; a very darkly powdered *Selenia illustraria*; two *Gnophos obscurata* var. *mundata* from Lewes; a rayed form of *Pieris napi*; a yellow aberration of *Noctua rubi*; and a long bred series of *Argynnis aglaia* with much variation.—Mr. Turner, a fine female of *Euanessa antiopa* taken at Vitznau on August 10th, and a well-marked and brilliant female under side of *Erebia æthiops* taken at Gersau on July 27th.—Mr. Hall, an abnormal flower of the sweet pea, having six parts and all separate, without a "keel."—Mr. Noad Clark, photomicrographs of the ova of *Coleophora virgaureæ* laid on the pappus hairs of *Solidago virgaurea*. They were upright eggs, and the young larvæ emerged from the micropyle.—Mr. Step, a *Diloba cæruleocephala* bred by his son, in which the "80" mark was blurred and extended.—Mr. West (Greenwich),

specimens of *Aleochara crassiuscula*, a Coleopteron new to Britain, discovered by him at Great Yarmouth; and also the rare and local Homopteron *Ideocerus scurra* from Blackheath on poplars.—Mr. Moore, a larva of *Acronycta psi* having an unusual development of the fleshy "horn."—Mr. Step, photographs of fungi recently obtained near Ashstead, including *Clavaria cristata*, *Polyporus acanthoides*, &c.—Mr. Sich, larvæ of *Aristotelia hermannella* mining a leaf of *Chenopodium album*, and referred to its colour changes.

September 24th.—The President in the chair.—Dr. Chapman exhibited a dark suffused specimen of *Brenthis pales* from Saas-Fée, and an example of *Anthrocera exulans* var. *flava* from the same locality.—Mr. Step, a number of photographs of fungi taken during the Society's Field Meeting at Claygate.—Mr. Lucas, the two rare fungi, *Trametes rubescens* and *Armillaria mellea*, from the New Forest; and also a specimen of *Chirocephalus diaphanus*, a very beautiful crustacean, found in water in a pool at Claygate during the Field Meeting.—Mr. Cowham, an example of *Ophiodes lunaris* bred in July, 1907, from an ovum sent him from South France by Dr. Chapman.—Messrs. Harrison and Main, a long series of *Eupithecia absinthiata* bred from larvæ collected on ragwort near Cork.—Mr. Newman, long series of *Agriades corydon* taken near Dover, including var. *obsoleta* and many blue females; many blue females of *Polyommatus icarus* from North Kent; and two striking forms of *Dicranura vinula*, one very dark, almost chocolate, suffused, the other having the zigzag lines unusually cleanly cut and dark, the middle area being very light.—Mr. Ashdown, a large number of Lepidoptera met with during a trip to Switzerland in July, 1908, including *Pieris daphidice*, *Thecla w-album*, *T. ilicis* ab. *cerri*, *Polyommatus dorilis*, *Lycæna arion*, *L. orion*, *L. pheretes*, *L. damon*, *Melitæ parthenie*, *Eneis ællo*, *Satyrus cordula*, *Pararge achine*, *Thyris fenestrella*, *Cleogene lutearia*, *Psodos coracina*, &c.—Mr. Moore, Lepidoptera from Northern Nigeria.—Mr. West (Ashtead), a fine specimen of the rare Hydroid Zoophyte, *Thuiaria thuja*, from Scarborough.—Mr. Coote, living larvæ of *Celastrina argiolus*, including one example which had been of an obscure red colour through all its instars.—Mr. Sich, *Parnassius apollo*, the imago bred from the larva exhibited at a previous meeting, and made remarks on the differentiation of the larva from that of *P. delius*.

October 8th.—The President in the chair.—Mr. Ashdown exhibited about seventy species of Coleoptera, Hemiptera, &c., taken by him in July, 1908, in Central Switzerland, including *Trichius fasciatus*, *Tricodes apicarius*, *Edemera podagrariæ*, *Leptura rubra*, *Clytus massiliensis*, *Strachia ornata*, *Cedipoda cærulescens*, &c.—Mr. Tonge, two bred specimens of *Aphantopus hyperanthus* ab. *cæca* from Surrey; and a bred specimen of *Melanargia galathea* var. *procida* from Hampshire.—Messrs. Harrison and Main, a bred series of *Pseudoterpnæ pruina* (*cytisaria*) from Epping Forest, showing great variation in the size, distinctness, and presence of the usual submarginal light-coloured line.—Mr. Newman, a bred series of *Malacosoma castrensis* from Essex, including the rare yellow unicolorous female, and the dark chocolate male; a bred series of *Ægeria andreniformis* from

North Kent, where it was much subject to the attacks of ichneumons; a series of *Hepialus humuli* var. *hethlandica* and a few *Pachnobia hyperborea* from Shetland; some *Anarta melanopa* from Rannoch; a second brood bred, *Abraxas grossulariata* October 8th, the first to emerge from over one hundred pupæ; a living *Thera firmata*, second brood; and a living second brood specimen of *Eumorphia elpenor*.—Mr. R. Adkin, recently deposited ova of *Tortrix pronubana*.—Mr. J. P. Barrett made a comparison of the lepidopterous fauna of North Kent thirty years ago and that of to-day, illustrating his remarks by series of *Aporia cratægi*, *Nonagria sparganii*, *Acidalia ochrata*, *Agrotera nemoralis*, *Tapinostola bondii*, *Eremobia ochroleuca*, &c.—Mr. South, on behalf of Mr. Waller, a female *Trichiura cratægi* with one antenna male. He also showed an *Epinephele jurtina* (*ianthina*) from Box Hill with symmetrical, pallid, internervular spaces; and a short series of *Rhodophæa suavella* reared from larvæ collected from sloe at Eastbourne.—Mr. Main, a living "stick" insect bred from the ovum shown in the spring.—Mr. Sich, bred *Gillmeria pallidactyla* from Byfleet.—H. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

On the Mouth-parts of some Blattidæ. By J. MANGAN, B.A. 'Proceedings of the Royal Irish Academy,' vol. xxvii. Sect. B, No. 1. 1908.

No one interested in the cockroaches in general, and the British species in particular, can well be without this most useful paper, which is illustrated by three excellent plates. It is published separately by Hodge, Figgis and Co., Dublin.—W. J. L.

Subfam. Decticinae of Fam. Locustidæ of the Orthoptera. Fascicle 72 of the 'Genera Insectorum,' published under the direction of P. Wytsman, Brussels. 1908.

THIS part, with two fine plates, is from the pen of the well-known American orthopterist, A. N. Caudell. In the long list of species enumerated occur five British species, some of which are, however, rather difficult to find under their new names:—*Tettigonia* (*Decticus*) *verrucivora*, *Pholidoptera griseocapta* (= *Thamnotrizon cinereus*), *Metrioptera albopunctata* (= *Platycleis grisea*), *M. (P.) brachyptera*, and *M. (P.) roeselii*.—W. J. L.

Subfam. Nyctiborinae of Fam. Blattidæ of the Orthoptera. Fascicle 74 of the 'Genera Insectorum.' 1908.

THIS small part (with one beautiful coloured plate), written by Mr. R. Shelford, M.A., deals with a subfamily of cockroaches which contains no genuinely British species, though one, *Nyctibora brunnea* (= *N. holosericea*), has occurred here once or twice casually.—W. J. L.

Additions to the Wild Fauna and Flora of the Royal Gardens, Kew.

VIII. 'Bulletin of Miscellaneous Information,' No. 7. 1908.

IN this Bulletin Mr. A. L. Simmons has added a considerable number of species to the Macro-Lepidoptera (with Tortricina) of the fauna of the Gardens, while Mr. A. Sich has been equally successful with the Micro-Lepidoptera. The list is of general interest, as notes accompany the insects referred to. The repeated occurrence of the name of the late Mr. G. Nicholson reminds us of a place that will not easily be filled in this labour of love in connection with the Gardens.—W. J. L.

Twenty-eighth Annual Report of the Entomological Society of Ontario for 1907. Published by the Ontario Department of Agriculture, Toronto. 1908.

THIS Report evidently fulfils the double purpose of giving an account of the doings of the Entomological Society and furnishing a report on entomology as practically connected with agriculture in the province. In some one hundred and forty pages will be found a mass of most useful information. The paper on which it is printed is rather poor; and the illustrations are somewhat crude, though they are not necessarily less useful on that account.—W. J. L.

OBITUARY.

THE 'Times' for September 24th last contained an obituary notice of the late Mr. GEORGE NICHOLSON, F.L.S., who passed away in September at Richmond, to the great regret of all botanists, and also of those entomologists who have been associated with him in investigating the insect fauna of the Royal Botanic Gardens at Kew. Mr. Nicholson was known universally as a botanist and horticulturist, and most lovers of gardens will be acquainted with his large work, the 'Illustrated Dictionary of Gardening.' He had studied in France, travelled much on the Continent and in America, and knew most of the great gardens of England, as his advice was frequently asked concerning them. For some fifteen years he was Curator of Kew Gardens, and after his resignation of that appointment, owing to failing health, he still took a very keen interest in the Gardens, and busied himself especially with working out the wild fauna and flora of the Gardens. As the lists, published from time to time in the Kew 'Bulletin,' will show, he was not only successful himself, but also infused great enthusiasm into those whose aid he sought in determining the species of the fauna with which he was not specially acquainted.

Mr. Nicholson's genial manner and his knowledge of things in general, besides his special knowledge of botany, made his conversation delightful, and the writer will never forget the charming afternoon walks in the beautiful gardens at Kew in his company, and the delight he always expressed when any additions to the fauna or flora were discovered.

A. S.



MALACOSOMA NEUSTRIA, Ab.

(To illustrate the Hon. N. Charles Rothschild's note on p. 257,
and to replace the illustration there printed.)

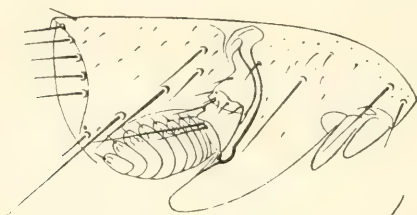


Fig. 1.

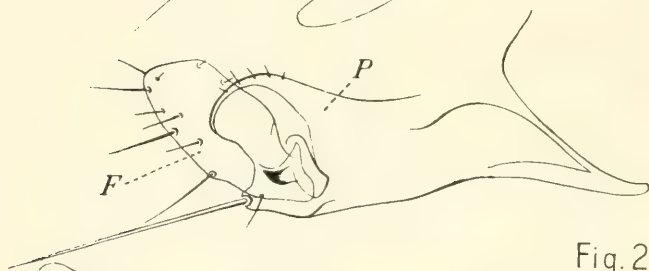


Fig. 2.

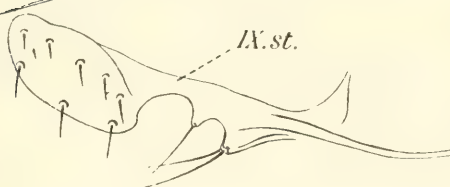


Fig. 3.

K.J. del.

West, Newman proc.

A NEW BAT-FLEA (NYCTERIDOPSYLLA LONGICEPS, sp. n.)

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[No. 547

A NEW SPECIES OF BAT-FLEA FROM GREAT BRITAIN.

BY THE HON. N. CHARLES ROTHSCHILD, F.E.S.

(PLATE VIII.)

Nycteridopsylla longiceps, spec. nov.

THERE are two five-combed bat-fleas in Great Britain, the one being apparently identical with Kolenati's *pentactenus*, while the other is new to science. This new species can easily be distinguished by the following characters:—

Head.—The head is very long and narrow, the frontal portion being about as long as the occipital portion (Pl. VIII. fig. 1). The two bristles placed on the sides of the frontal portion are consequently farther apart than in *pentactenus*.

Thorax.—The epimerum of the metathorax bears four or five bristles (1 or 2, 2, 1).

Abdomen.—The comb of the seventh tergite contains seventeen or eighteen bristles. The seventh sternite is sinuate in the female, but the lobe above the sinus is much shorter than the one below the sinus (Pl. VIII. fig. 2), while in *pentactenus* the upper lobe projects as far as the lower one.

Legs.—The hind femur bears posteriorly near the apex but one ventral bristle on each side. The bristles of the tibiæ are distinctly longer than in *pentactenus*, the longest apical one of the mid-tibia reaching almost to the apex of the first tarsal segment.

Modified Segments. — ♂. The eighth tergite bears at the dorsal edge five long bristles, and close to this row one or two smaller lateral ones, there being also one or two lateral bristles behind, and some distance from, the stigma. The eighth sternite, which is sinuate ventrally in the centre, bears on each side an apical row of five long bristles, proximally to which there are five or six shorter bristles. The process (p) of the clasper is broad, being rounded on the proximal

side and incurved on the distal side (Pl. VIII. fig. 2). The movable process (F) is very slightly rounded on both sides, and obliquely truncate at the apex, as shown in the figure. There are four long bristles on this process besides a number of small ones, three long bristles being placed on the apical third, while the fourth is placed half-way between the most ventral one of these and the long bristle of the clasper. The bristles near the apex of the finger are not quite constant in length. The ninth sternite of each side consists, as in the allied species, of a proximal and a distal portion separated from each other by a large sinus. At the proximal corner of this sinus, up to which point the right and left halves of the segment are fused, there are two long bristles, one on each side. A short distance beyond this angle there is a short conical process which projects downwards, and bears a thin bristle at the apex. The distal portion of the ninth sternite is broad with an obtuse apex, the ventral and dorsal edges being slightly rounded with the apex feebly curved upwards (Pl. VIII. fig. 3). There are on this portion of the segment three bristles along the ventral edge and five near the dorsal edge.

♀. The eighth tergite has one or two bristles above the stigma, three below it, and four or five ventrally on the lateral surface, there being nine to eleven along the apical edge, of which three or four are longer than the other apical bristles. The stylet is very slender, being four times as long as it is broad at its base.

We have a series of both sexes of this interesting species taken from *Plecotus auritus* and *Scotophilus pipistrellus* at Henley-on-Thames, Tring, Wells (Somerset), Harrow, Welwyn, and Tonbridge.

PAPILIO CAMILLA, LINNÆUS (1764).

By T. H. BRIGGS, M.A., F.E.S.

ALTHOUGH it is now thirty-six years since Mr. Kirby, in 'The Zoologist' for 1872, p. 2952, stated that the *camilla* of Linnæus was the butterfly found in this country, and not the continental species now so named, his statements seem never to have been recognized or adopted since that time, except by Mr. South in his 'The Butterflies of the British Isles,' published in 1906.

The first mention of "*camilla*" was by Linnæus in his Mus. Ludov. Ulr. No. 122, p. 304 (1764), of which the following is the whole description there given. I must preface this by observing that all the descriptions in this work have a short "definition" at the commencement, and then a detailed description at a much greater length than those in any of the different editions of his 'Systema Naturæ' or his 'Fauna Suecica,' and that just previously to this description of "*camilla*" is that of *prorsa*, of which I only need give the short definition at the commencement, as the long one which follows is not material to this paper :—

“Prorsa, Papilio.”

“Mus. Ludov. Ulr. No. 121, p. 303 (1764). ”

“Alis dentatis concoloribus fuscis fascia alba, subtus lutescentibus. Habitat in Germania”; and a note at the end: “Obs. hæc descriptio facta est ad Papilionem. Rœs. 3, t. 70, figs. 1, 2, 3, quam credit meram varietatem Camillæ; Rœselii vero pag. 1, 8, figs. 6, 7, alia omnino ab. hæc proposita est species.”

DESCRIPTION OF *Camilla*.

“Camilla, Papilio.”

“Ludov. Mus. Ulr. No. 122, p. 304 (1764). ”

“Alis dentatis fuscis subcoloribus alba fasciatis maculatisque; angulo ani rubro. Habitat in Lonicera cærulea Germaniæ.”

This is the short “definition”; the long description is as follows:—

“Alæ supra omnes nigricantes.

“Primores. Fascia arcuata, alba, in medio interrupta in maculas, quarum mediæ minores. Puncta aliquot, alba, versus apicem.

“Posticæ. Fascia cuneiformi alba solum nervis dissecta. Macula ad angulum ani rubra cum Punctis duobus nigris majusculis.

“Subtus omnes flavescentes. Fascia cærulescenti-albida, extra quam puncta angulata duplici serie.

“Differt imprimis a præcedenti macula rubra alarum posticarum ad angulum ani, quam in quibusdam deesse observavit Rœselius.”

I think that the description here given—“fascia arcuata” on the fore wings, “fascia cuneiformi alba solum nervis dissecta, macula ad angulum ani rubra cum Punctis duobus nigris majusculis” on the hind wings, and the ground colour of the under side, “flavescentes,” would convince anyone that the insect Linnæus was here describing as “*camilla*” was our insect, and not the continental allied species, which, so far as I know, has never yet been observed in this country.

There is no reference here to the blue-black colour of the upper surface of all the wings, the row of dark marginal spots on each wing, the white discoidal spot on the fore wings, where the other white spots do not form a fascia; and on the under side the nearly straight, not wedge-shaped, white fascia, and the much darker almost coffee-coloured ground colour of the continental species, which are some of the differences in the markings of the two insects which serve to distinguish them.

In 'The Zoologist' for 1872, p. 2952, Mr. Kirby states :—

"*Limenitis camilla*, L.—In 1764 Linnæus described the sexes of our English 'White Admiral,' calling the male *prorsa* and the female *camilla*. But as he had previously described another species under the name "*prorsa*," he properly changed the name of his second species into *sibilla* in 1767. This, therefore, establishes the name of our species to be correctly *camilla*, L."

The description of *sibilla*, Linn., Syst. Nat. xii. No. 186, p. 781 (1768), is identical with that of the first paragraph of "*prorsa*" in the Mus. Ludov. Ulr., with the addition of "Mus. Ludov. Ulr. 303, sub *prorsa*. Habitat in Germania, similis *camillæ*." That of *camilla*, No. 187, in the same work is also identical with that of the first paragraph of the description of *camilla* in the Mus. Ludov. Ulr., with the addition of "Mus. Ludov. Ulr. 304. Habitat in Lonicera cærulea Europe." So *camilla* seemed to have had a more extended range than *sibilla*.

The description of the first *prorsa* (Linn. Syst. Nat. x. No. 134, p. 480 (1758) (which was the cause of his changing the name of the "*prorsa*" of 1764 to *sibilla*) is—

"*Prorsa*."

"*Alis dentatis subfuscis: fascia utrinque alba: primoribus interrupta. Roes. Ins. i. pag. 1 to 8, f. 6, 7. Habitat in Urtica Germaniæ.*"

A very different description from that of the *prorsa* of Mus. Ludov. Ulr., and a different food-plant.

Mr. Kirby also states his reasons more fully in his 'Hand-book of the Order Lepidoptera,' vol. i. pp. 142-6 (1894), where he also gives a reference to Aurivillius, Recens. Crit. Lep. Mus. Ulr. pp. 101-2 (1882), and, as this work is perhaps not very generally known, I will give the extract in full :—

"*Nymphalis camilla* (L.).

"*Dubium esse non potest quin sic hæc species P. camilla, L. et eo nomine appellari debeat. Fuit enim P. Prorsa editionis decimæ systematis alia species, et est ergo Camilla nomen vetustissimum, quod huic formæ conservari potest, qua sententia etiam auctores nonnulli et ii celeberrimi jam antea fuerunt.*"

It has been agreed that the *prorsa* and *camilla* of the Mus. Ludov. Ulr. and the *sibilla* and *camilla* of Linn. Syst. Nat. xii. are sexes of the same insect, but from Linnæus's descriptions alone one would be inclined to consider them separate species, or else he would not have given them distinct names. There does not seem to have been any uniformity, when in the case of an author describing an insect under two names but separately numbered in the same work, which are afterwards found to be sexes of the same insect, whether the name given to the male or

female should be preferred; but the recent usage seems to be that the name which has the prior number in the work should be applied to *both sexes*, although both names were published at the same time. For instance, "*Jurtina*" ♀ (Linn. Syst. Nat. x. No. 104, p. 475 (1758)), has superseded *janira* ♂, No. 106, in the same work, and "*Sannio*" ♂ (Linn. Syst. Nat. x. No. 48, p. 506) has given place to *russula* ♀, No. 78, p. 510, in the same work. So the name chosen does not depend upon sex.

In this country all the old authors called our insect "*camilla*"—Harris (1766), Lewin (1795), Donovan (1798), Haworth (1803), Curtis (1824), Stephens (1828), Wood (1833), and Westwood (1841)—and the first record I can find of the name "*sibilla*" being applied to our insect in this country is in Doubleday's first Synonymic List in 1850.

As Linnæus, in 1768, referred "*camilla*" to the insect of that name in his previous work of 1764, the name *sibilla* ought, therefore, to be abandoned, and that of *camilla* given to both sexes of our insect, and the continental species, as Mr. Kirby has already stated, will take the name of "*drusilla*," Bergsträsser, Nomencl. iii. pl. 69, figs. 5, 6 (1779), as it is impossible to have two closely allied species under the same name in the same genus.

Lynmouth.

DESCRIPTION OF A NEW SPECIES OF *CERATINA* FROM BORNEO.

By P. CAMERON.

Ceratina cosmiocephala, sp. nov.

Fulvous; the vertex, laterally extending to the end of the top of the eyes, obliquely widened below; the occiput, the front broadly, a broad line running down from each antenna to opposite the end of the eyes, where it turns outwardly along a furrow, a line on the sides of the base of the mesonotum, broadening outwardly, a transverse one on the apex, an irregular broad line on the sides of the apex of the second abdominal segment, a regular one, not occupying quite the half of the base of the third, a broader one on the fourth and the fifth except for an irregular longitudinal mark in the middle, black; the following spots are bright lemon-yellow: two oval spots in the centre of the front, a transverse spot below the antenna, rounded and narrowed above, the sides also rounded but not narrowed, below it is a large mark, wide but narrowed below, its top bluntly rounded, its apex prolonged laterally, but not so widely, to near the eyes, a line along the inner orbits gradually widened from the top to the bottom, and with an irregular inner edge, the labrum except for a fuscous spot on either side near the top, the basal, widened half of the mandibles, almost the inner half of the outer orbits, almost the whole of the prothorax, a line along the outer edge of the mesonotum, two narrower lines in the centre, on the apical two-thirds, scutellums,

tubercles, an irregular mark dilated on the top, at the apex, down the basal half of the mesopleuræ, and the metanotum broadly laterally. Legs coloured like the body, but with the four anterior femora and tibiæ largely yellow, and the hinder tibiæ blackish behind. Wings hyaline, the costa and stigma dark, the nervures of a lighter fuscous colour. Antennæ black, the flagellum fuscous, the scape lined with yellow below. ♀. Length, 7 mm.

Kuching, Borneo (John Hewitt, B.A.).

Smooth, shining, the labrum strongly, the mesopleuræ less strongly punctured; the apical abdominal segments roughened. Except on the apical abdominal segments, on which it is shorter, closer, and black, the pubescence is white.

NOTES ON BRITISH BRACONIDÆ.—VII.

By CLAUDE MORLEY, F.E.S., &c.

EUPHORIDÆ.

As I stated in my last paper (Entom. 1908, p. 125), this family is distinguished from the Meteoridæ, there treated of, solely by its lack of a dividing nervure between the second and third cubital cells; but, in my opinion, this is but a poor character, since all the subcubital cells are often obsolete or entirely wanting in many of the smaller and more weakly developed species of the present family; and, in the genus *Perilitus*, we get the first cubital and discoidal cells confluent, as well as a partially wanting radial nervure, which indicate how inconclusive must be characters drawn from pellucid or interstitial neuration in this group. A very few species of the Euphoridæ are extremely abundant with us in the spring, but the great majority are of rare occurrence, and I have met with but a very limited number during the past fifteen years, a neglect for which the small size of so many is doubtless responsible. Most, probably all, of them are coleopterous parasites, two have been bred from *Orchesia minor*, Walk., and species of *Timarcha*; and there is a great field open here for the Coleopterist, who takes the trouble to breed his Phytophaga, to prove their association with these pretty little Braconids.

We have all the European genera but the curious *Cosmophorus*, Ratz. :—

- | | | |
|-----|--|---------------|
| (4) | 1. Antennæ curiously modified. | |
| (3) | 2. First cubital cell discreted from first discoidal | EUSTALOCERUS. |
| (2) | 3. First cubital cell confluent with first discoidal | STREBLOCERA. |
| (1) | 4. Antennæ normal. | |

- | | | |
|------|--|--------------|
| (6) | 5. Basal segment longer than all the following; head broad | WESMAELIA. |
| (5) | 6. Basal segment not longer than following together; head of normal breadth. | |
| (10) | 7. Radial cell very short, strongly arcuate apically. | |
| (9) | 8. Metathorax neither vertically truncate nor apically excavate | EUPHORUS. |
| (8) | 9. Metathorax vertically truncate and apically excavate | PERILITUS. |
| (7) | 10. Radial cell longer, narrower, reaching nearer apex of wing | MICROCTONUS. |

The first three genera are very rare; of the single species, *clavicornis*, Wesm., of the first, only two specimens (from Belgium and England) are known. *Streblocera* possesses two, *S. fulviceps*, Westw., and *S. macroscapa*, Ruthe, which is distinguished from the former by the female having the antennæ once elbowed, and the male not at all, in place of twice in both sexes; some three examples of the first and five of the second are known. *Wesmaelia cremasta*, Marsh., has been found only at Bielsa in the Pyrenees, in Devonshire, and Germany; but several American species are known.

EUPHORUS, Nees.

- | | | |
|------|--|----------------------------|
| (2) | 1. Basal abdominal segment hardly longer than broad | <i>mitis</i> , Hal. |
| (1) | 2. Basal abdominal segment fully thrice longer than broad. | |
| (14) | 3. Notauli punctate and entire. | |
| (5) | 4. Antennæ 16-jointed; male unknown | <i>similis</i> , Curt. |
| (4) | 5. Antennæ of female more than 16-jointed (except rarely in <i>E. picipes</i>). | |
| (11) | 6. Mesonotum punctate. | |
| (8) | 7. Antennæ of female 16- to 18-jointed, of male 19- to 21-jointed | <i>picipes</i> , Hal. |
| (7) | 8. Antennæ more than 18-jointed, of male 23- to 27-jointed. | |
| (10) | 9. Spiracular tubercles of basal segment indistinct | <i>pallidipes</i> , Curt. |
| (9) | 10. Spiracular tubercles of basal segment prominent | <i>tuberculifer</i> , Msh. |
| (6) | 11. Mesonotum glabrous. | |
| (13) | 12. Basal abscissa of radius short and punctiform | <i>coactus</i> , Marsh. |
| (12) | 13. Basal abscissa of radius wanting (<i>Harkeria</i> , Cam.*) | <i>accinctus</i> , Hal. |

* Cameron's new genus, *Harkeria* (Ann. Nat. Hist. 1900, p. 537), is certainly not distinct from *Euphorus*, Nees, and the only differential point I can trace is the shape of the alar stigma, which is said to be linear, elongate, and narrow; whereas in the latter it is large and triangular. But the

- (3) 14. Notauli smooth and not entire.
 (16) 15. Notauli not entirely wanting, distinct in front *intactus*, Hal.
 (15) 16. Notauli entirely wanting.
 (20) 17. Body testaceous, anus infuscate.
 (19) 18. Wings clouded; basal segment linear . . . *apicalis*, Curt.
 (18) 19. Wings hyaline; basal segment distinctly dilated apically *ornatus*, Marsh.
 (17) 20. Body piceous or black.
 (22) 21. Antennæ of female filiform, and longer than head and thorax *parvulus*, Ruthe.
 (21) 22. Antennæ of female incrassate apically, and much shorter *fulvipes*, Curt.

E. picipes.—A common species from May 14th to June 12th only. I have a single very small male, taken on the sand-hills at Kilmore, in Ireland, on August 14th, 1898, by the late Alfred Beaumont; but I fancy this must belong to some distinct and undescribed species. Females are the commoner sex, and may frequently be beaten from bushes and swept from herbage in woods; but no host has yet been suggested for it. I have taken it at Haven Street and Norton Woods, in the Isle of Wight, at Gosfield, in Essex, and at Tuddenham Fen, Stanstead, and Barnby Broad, in Suffolk, as well as in Matley Bog, in the New Forest.

E. pallidipes.—An abundant species from May 10th to July 3rd, and usually taken by sweeping low herbage; it is said by Curtis (B. E. fol. 476) to have been once bred in England from the pupa of *Orchesia*, a common heteromerous beetle living in Boleti. Piffard has found it at Felden, in Herts; I have seen it at Calbourne, in the Isle of Wight, Brockdish, in Norfolk, Belstead, Stanstead, Barton Mills, Bentley, Brandon, Foxhall, and Henstead, in Suffolk. Its variety, with the head mainly red, is rarer, though not uncommon in marshes in the same county at Tuddenham, Reydon, and Brandon from the middle of June to July 2nd; and Wilson Saunders took it at Greenings, in Surrey, in June, 1871. The second variety, with the body also mainly red, has not hitherto been noted in Britain; but I possess an example, captured recently at Felden, in Herts, by Mr. Albert Piffard, F.E.S.

E. intactus.—I have a single female, which I believe referable

especial point, upon which his genus is founded, is the basally wanting radial nervure, and this is described exactly as it was by Haliday in the case of his *E. (Leiophron) accinctus*, male, in the old 'Entomological Magazine' of 1835, p. 465: "Stigmate . . . areolam cubitalem secundam contingente." I am strongly inclined to regard *Harkeria rufa* (loc. cit., p. 538), from Gloucester, as the hitherto unknown female of *Euphorus accinctus*, Hal., which no one has taken for seventy years, and for which no locality more exact than England or Ireland has yet been given.

to this species; it was beaten from an old oak in the Wilverley Inclosure, in the New Forest, June 14th, 1907.

E. apicalis.—Two females of this beautiful species (figured by Curtis, B. E., pl. 476) were beaten from oak on July 2nd, 1904, and the same date in 1906 in Cutlers Wood, Freston, and an alder carr at Reydon, both in Suffolk.

PERILITUS, Nees.

- | | | | |
|------|-----|---|---------------------------|
| (10) | 1. | First cubital and discoidal cells not separated by a nervure. | |
| (9) | 2. | Radial nervure apically strongly arcuate. | |
| (8) | 3. | Abdomen entirely or apically black. | |
| (7) | 4. | Stigma infusate or nigrescent. | |
| (6) | 5. | Metanotum with distinct areæ. | <i>cerealium</i> , Hal. |
| (5) | 6. | Metanotum rugulose throughout, with no areæ | <i>æthiops</i> , Nees. |
| (4) | 7. | Stigma pale testaceous | <i>bicolor</i> , Wesm. |
| (3) | 8. | Abdomen mainly or, at least, apically testaceous | <i>secalis</i> , Hal. |
| (2) | 9. | Radial nervure apically hardly arcuate | <i>brevicollis</i> , Hal. |
| (1) | 10. | First cubital and discoidal cells separated by a nervure. | |
| (12) | 11. | Radial nervure ending exactly half-way between stigma and apex | <i>falciger</i> , Ruthe. |
| (11) | 12. | Radial nervure ending much nearer apex of wing than that of stigma. | |
| (14) | 13. | Hind femora and tibiæ testaceous throughout | <i>rutilus</i> , Nees. |
| (13) | 14. | Hind femora or tibiæ more or less nigrescent | <i>strenuus</i> , Marsh. |

P. æthiops.—This is said to be a common species, but I possess only a single male, swept from a hedge-bottom at Lakenheath, Suffolk, July 13th, 1899.

P. bicolor.—Beaumont has given me several females of this species, which he found commonly on the sand-hills at Kilmore, in Ireland, on August 10th and 23rd, 1898.

P. secalis.—I possess a female captured at Felden, Herts, by Piffard.

P. rutilus.—Also taken at Felden by Mr. Piffard. Several females occurred to me by sweeping beans in a field at Wicken, Cambs., June 7th, 1902. I swept a male at Ipswich on July 3rd, 1895; and took a female on my study window at Monk Soham as late as October 10th, 1906. It is doubtless an abundant species, and I suspect it of preying upon species of *Sitones*.

P. strenuus.—The only male I have seen was captured on a flower of *Feniculum vulgare* on the coast at Alderton, in Suffolk, September 3rd, 1899.

MICROCTONUS, Wesm.

- | | | |
|-----|----|---|
| (6) | 1. | Metanotum finely carinate centrally. |
| (3) | 2. | Median nervure of anterior wings obsolete |
- conterminus*, Nees.

- (2) 3. Median nervure of anterior wings always visible.
- (5) 4. Metanotum with five areae *testaceus*, Capron.
- (4) 5. Metanotum with three areae *cultus*, Marsh.
- (1) 6. Metanotum not centrally carinate.
- (8) 7. Basal abdominal segment aciculate; body mainly pale *splendidus*, Marsh.
- (7) 8. Basal abdominal segment glabrous; body, except head, black *xanthocephalus*, Marsh.

M. splendidus.—One female was swept from reeds at Southwold in a salt-marsh, August 1st, 1900. Bignell was sceptical of this determination, but the insect agrees in every particular with Rev. T. A. Marshall's description.

M. xanthocephalus.—Donisthorpe has given me a female which he took in Co. Kerry, June, 1902.

DESCRIPTION OF A NEW GENUS AND SPECIES OF CRYPTINÆ (ICHNEUMONIDÆ) FROM BORNEO.

By P. CAMERON.

PALMERELLA, gen. nov.

Areolet minute, punctiform, the recurrent nervure received at its apex; the transverse median nervure received shortly behind the transverse basal; transverse median nervure in hind wings broken near the bottom; radial cellule elongate; disco-cubital nervure unbroken. Metanotum with one transverse keel, and with a square area in the middle of the base, behind the keel; the sides at the apex armed with long spines; the spiracles ovate, of moderate size. Abdominal petiole rather stout, broad, curved, longer than the second segment. The third antennal joint not much longer than the fourth. Hind legs very long. Palpi long, the maxillary reaching to the middle coxæ. Scutellum roundly, broadly conical; the apex has a long, steep slope. Eyes large, parallel. Thorax fully three times longer than wide; the head is wider than it; its front is depressed and is keeled down the middle; there is a complete metapleural keel. The parapsidal furrows extend from the base to the apex of the mesonotum.

The type of this genus differs from the other *Mesostenini* (the group to which it belongs) in having the body and legs black: the scutellum is much more prominent than it is with *Mesostenoides* or *Buodias*, and, more particularly, in being steeply declivous behind; the hind legs are longer and more slender, and the abdomen shorter and narrower, its petiole stouter and of more equal width, as well as being longer compared with the second segment. Looked at from the sides the base of the metanotum is seen to be depressed, the post-scutellum appearing behind the depression as a small tubercle.

The type of the genus has hardly the appearance of a

Cryptid ; it looks, in fact, like one of the *Accenitini*. I unfortunately only know the male.

Palmerella nigra, sp. nov.

Black ; a small squarish white spot immediately below the antennæ and the palpi white, the fore legs brownish testaceous in front ; wings clear hyaline, the nervures and stigma black. ♂. Length, 8 mm.

Kuching, Borneo (John Hewitt, B.A.).

Face and clypeus closely, rugosely punctured, the former almost reticulated ; the front and vertex more closely and finely reticulated-punctured. Flagellum of antennæ fuscous, black above. Thorax, except the lower part of the propleuræ, closely, distinctly punctured ; the scutellum more strongly than the mesonotum, the metanotum still more strongly and more clearly reticulated ; the depression on the propleuræ striated below the middle. First abdominal segment distinctly but not closely punctured ; the second closely and regularly punctured ; the punctuation on the others becomes gradually weaker. Legs shortly, thickly haired ; the coxæ and femora rather strongly, closely punctured ; the long spur of the hind tibiæ reaches to the middle of the metatarsus ; the apex of the third joint of the hind tarsi and the fourth yellowish white.

COLIAS EDUSA BRED IN OCTOBER, 1908.

By F. W. FROHAWK, M.B.O.U., F.E.S.

It may interest some of the readers of this Journal to know I have succeeded in rearing a nice series of *C. edusa* this autumn from a female captured August 7th at Wallasea, Essex (recorded in the September issue, p. 229). I find, on going over the set specimens, which number sixty, just thirty are males and thirty females. A few others of both sexes emerged, which I did not set ; therefore the sexes produced were of about equal proportion. Most of the females resemble the parent in having the marginal spots reduced in both number and size, which are almost absent in some. The central spots on the primaries are larger than usual, and a few have the central blotch of the secondaries exceptionally large, forming in two or three specimens conspicuous variation.

The eggs hatched at the end of August. The parent died August 30th. The first larva spun up for pupation September 21st, and pupated on 23rd, followed by others daily. The first imago (a male) emerged October 8th, followed by others of both sexes daily during the following fortnight.

All the specimens (excepting two or three not set) are of full average size, owing to the fine warm weather during the feeding up of the larvæ and the emergence of the butterflies ; usually late autumnal specimens are reduced in size by cold weather.

NEW AMERICAN BEES.—VII.

By T. D. A. COCKERELL.

OLIGOTROPUS, Robertson.

ROBERTSON (Trans. Am. Ent. Soc. xxix.) has segregated from *Megachile*, under the name *Oligotropus*, a species which he names *O. campanulæ*, but which is evidently the same as that formerly reported as *Megachile exilis*. I possess a specimen of this from Robertson, but I have not seen the true *M. exilis*, Cresson, described from Texas. The group is a distinct one, and possibly deserves generic rank; in addition to the characters reported by Robertson, it has some peculiarities of the galea and maxillary palpi, as indicated in Ann. & Mag. Nat. Hist., March, 1902, p. 232. Upon comparing the available materials, I am able to discriminate several closely allied species or races, occupying different regions. These may be separated as follows:—

Anterior tarsi of male pale ferruginous (Humid lower austral zone of Texas) *Megachile exilis*, Cresson.

Anterior tarsi black or brownish black 1.

1. The two middle nodules on lower edge of female clypeus much closer together than the distance from either to the lateral nodule; female about 10 mm. long; abdominal bands in both sexes very narrow, but distinct, and pure white (Boulder, Colorado, July 24th to Aug. 4th, 1908, S. H. Rohwer)

Megachile subexilis, n. sp. or subsp.

The nodules nearly equally spaced, but the interval between the lateral and median ones large; insect a little larger and more robust than the last, with the abdominal bands very distinct, and yellowish (West Fork of Gila River, New Mexico, July 16th, C. H. T. Townsend; Rio Ruidoso, New Mexico, on flowers of *Vicia* aff. *pulchella*, alt. 6700 ft., July 27th, male, C. H. T. Townsend)

Megachile semiexilis, n. sp. or subsp.

The small lateral nodules very close to the median ones; abdominal bands only moderately distinct 2.

2. Last ventral segment of female with black hair; lower margin of clypeus strongly arched or concave (Southern California) *Megachile angularum*, Ckll.

Last ventral segment of female with light hair; lower margin of clypeus scarcely arched (Southern Illinois, Robertson; Indiana, from Lovell)

Megachile campanulæ (Rob.).

M. semiexilis is the species of New Mexico hitherto recorded as *exilis*; the mouth-characters recorded in Ann. Mag. Nat. Hist. (as cited above) under *exilis* were derived from *semiexilis*. I have a series of each of the Rocky Mountain forms, and there

is no doubt that they are distinct. In the male it is hard to distinguish *campanulæ* from *subexilis*, but *campanulæ* has the wings evidently darker. The male of *M. angelarum* is not known. The Gila River is the type locality for *M. semiexilis*.

Colletes myroni, n. sp.

♀. Length, 9 mm. or a little over, rather robust; *thorax above with bright orange-fulvous hair (with no black)*; *hair of head entirely, and of pleura, black*; that of sides of metathorax thin and pale yellowish; hair of legs black, except on inner side of tarsi, where it is orange-fulvous; abdomen oval, rather small, very shiny, with scattered extremely minute punctures (close at extreme base of second segment); first segment with long pale yellowish hair (some black at extreme sides); remaining segments with rather inconspicuous black hair, but second with some scattered pale yellowish hair on disc, and a feeble apical band of short whitish hair. Clypeus densely, coarsely, more or less confluent punctured; labrum shining, with a central pit, the edges of which are raised; antennæ entirely dark; facial depressions large and broad; vertex shining; mesothorax shining, with distinct, rather close punctures; no visible prothoracic spines; tegulæ shining black; base of metathorax with the pits irregular, more or less transversely ridged, and less distinctly bounded behind than is usual; wings dusky, with piceous nervures; first r. n. joining second s. m. before its middle; second r. n. with a strong double curve; hind spurs simple. Malar space short, more than twice as broad as long. A remarkable species, looking like some forms of *Andrena*, as *A. berberidis*. The shining black abdomen suggests *C. nigrifrons*, Titus, but that species is narrower, has quite differently coloured hair on thorax above, and small narrow facial depressions. I do not know of any species which can be said to be closely allied.

Hab. Boulder, Colorado, May 26th, 1908 (S. A. Rohwer). Named after Mr. Myron H. Swenk, in recognition of his very valuable work on the genus *Colletes*.

Panurginus didirupa, n. sp.

♂. Length about 7 mm.; in the table in Ent. News, 1907, p. 184, runs to *P. ornatipes*, to which it is very closely allied. It differs from *P. ornatipes* by the longer antennæ, the entirely black scape, the supraclypeal mark (which is almost exactly square) extending half its area above the general level of the lemon-yellow of the face, and the hind tibiæ black except at extreme apex. Clypeus very strongly punctured, without any median groove (in *P. boylei* there is a very distinct groove); flagellum entirely black; dog-ear marks small, cuneiform; front densely punctured; mesothorax shining; wings strongly dusky; second and third abdominal segments broadly depressed basally, this area covered with fine silky brownish-grey hair; hind tarsi with first two joints yellow, the others brown.

♀. Almost exactly like *P. ornatipes*, but the shining apical depressions of the abdominal segments are minutely granular (smooth in *ornatipes*), and the area of the metathorax is better defined. Wings

strongly smoky; nervures and stigma dark fuscous; mesothorax very shiny, with sparse but strong punctures; hind tarsi black.

Hab. North Boulder Creek, Boulder County, Colorado, in the Canadian Zone (S. H. Rohwer, 1907). The type is a male, Aug. 21st. The female was taken Aug. 22nd. The specific name refers to the yellow face of the male, in the language of Celebes.

At Livermore, Colorado, Aug. 12th, 1908, Mr. Rohwer took *Perdita lacteipennis*, Swenk & Ckll., and *Panurginus piercei*, Crawf., at flowers of *Helianthus*. These species are new to Colorado.

University of Colorado, Boulder, Colorado:
October 25th, 1908.

NOTES FROM SOUTH-WESTERN FRANCE.

BY W. G. SHELDON, F.E.S.

RETURNING from Andalusia last spring, I stopped at Guéthary, near Biarritz, from 23rd to the 29th of May. Guéthary is at all times a very charming spot for a short sojourn, and in July and August on a previous occasion, when passing through, *en route* for Spain, quite a number of interesting Diurni were observed. On this occasion, however, I cannot report that the butterflies seen were either numerous in species or examples, and those that did occur were few of them of special interest. Amongst them, on most days, I came across several specimens of *Everes argiades* in good condition; these were presumably a first brood, and the brood I observed in the middle of July, 1905, just going off, and a brood coming on during the second week in August the same year, would, no doubt, represent the second and third broods. Assuming that there would be another brood in September, it seems probable that in this district *E. argiades* gets in at least four broods each summer. A few *Melitæa cinxia* were observed in one small locality; and on a marsh, *M. aurinia* of the typical Central European form were abundant. I observed a single example of *Papilio podalirius*, but failed to effect its capture. *Brenthis selene* was not infrequent, and was generally distributed; I had on my previous visit taken the second brood of this species in August. A worn *Colias edusa* var. *helice* afforded me a few ova, from which, on my return home, I bred seven examples—two typical males and females, and three var. *helice*. An interesting capture was four examples of undoubted *Melitæa parthenie*. Other species observed were: *Cænonympha pamphilus*, *Pieris brassicæ*, *P. rapæ*, *Cyaniris argiolus*, *Pararge egeria* (typical), *Nisoniades tages*, *Hesperia malvæ*, *Pyrameis cardui*, *Brenthis dia*, *Gonepteryx rhamni*, *Polyommatus baton*, *P. alexis*, *Melitæa*

phœbe, *Euvanessa antiopa*, *Leucophasia sinapis*, *Pyrameis atalanta*, *Limenitis camilla*, *Euchloë cardamines*, and *Epinephele ianira*. Larvæ of *Euvanessa antiopa* and *Eugonia polychloros* were exceedingly abundant on the sallows, and I brought away a batch of ova of the former species, from which a fine series of imagoes was reared in August; a large number of these I turned out in the garden here.

Youlgreave, South Croydon: Oct. 30th, 1908.

DESCRIPTION OF A NEW GENUS AND SPECIES OF BRACONIDÆ FROM BORNEO.

BY P. CAMERON.

PACHYBRACON, gen. nov.

Eyes large, pubescent; there is a distinct malar space; temples wide, obliquely narrowed; the occiput transverse, not margined. Palpi long, stout, the maxillary six-jointed. Four front legs normal, the hinder long, thickened, densely haired, especially the tibiæ, on which the hair is long, dense, thick, as it is also on the metatarsus. Calcaria moderately long; the claws small, simple. Otherwise as in *Bracon*. The antennæ are placed on the top of the head; the mesonotum is trilobate; the abdomen is broader than the thorax and is ovate; the basal segment is broad at the base; the apex is as broad as the length; there is no keel on the second segment; there is a long ovipositor; the basal joint of the hinder tarsi is shorter than the others united; the third and fourth are smaller than the second or fifth. The antennæ are longer than the body, are stout, and of equal width. There is a distinct, crenulated, suturiform articulation.

This genus may be described as a *Bracon* with hairy eyes, and with the hind legs greatly thickened and densely covered with long stiff hair. No species of Braconinæ with pubescent eyes has hitherto been described, although hairy eyes are known with some of the other groups, *e. g.* with *Chelonus*.

Pachybracon fortipes, sp. nov.

Black; the basal two-thirds of the antennal flagellum rufo-testaceous; the wings blackish to the base of the stigma (including the first cubital cellule), milky hyaline beyond; the hind wings blackish to near the apex; the stigma, except in front, the radius, and the cubitus from the first transverse cubital nervure are pale yellow, almost white; the recurrent nervure is almost interstitial. Head and thorax smooth and shining, sparsely covered with short black hair, the pubescence on the face paler, on the palpi white. Abdomen opaque, closely, rugosely punctured, the apical two segments smooth and shining. The apical abscissa of the radius is as long as the basal two united. Length, 7 mm.; terebra, 2 mm. ♀.

Kuching, Borneo (John Hewitt, B.A.).

The radius issues from the basal third of the stigma. The sculpture is stronger on the second abdominal segment than on the others; it runs on it into reticulations.

The coloration of this species seems to be common in Borneo; it is found in *Iphiaulax*, *Cremnops*, and *Disophrys*.

THE BASSES-ALPES IN AUGUST.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from p. 262.)

THIS aberration appears in every respect to correspond with ab. female *midas*, Lowe, which occurs also on the high cliffs of Vernayaz in the Rhone Valley.

A morning in the gully that leads up to the high rocks overlooking the Dourbes road may generally be counted well spent. This year, however, much of the shrubbery and undergrowth has been cut down, and in August also the *garrigues*—the successive steps of long deserted vineyards, in which the wild flowers run riot—are more or less burnt up. A large white scabious proves the most attractive bait for such butterflies as are about—worn examples of a third (?) brood of *A. dia*, *S. actæa*, in all stages of dilapidation, fresh *P. daphidice*, and some monster *P. podalirius* ab. *feisthamelii*, while not a few semi-transparent *Z. ephialtes* var. *coronilla* testify to earlier abundance. On the summit there is the usual concourse of Papilionidæ, but not much else; the *P. machaon* of normal size, and in colour for all the world as though they had just been introduced from the Cambridgeshire Fens!

Meanwhile, I had not forgotten the quest for *E. scipio*, and on the 18th left Digne at half-past five upon the tramp which was before me. But the north precipices of the long range of cliffs that seem to shut in the valley so completely are out of the sun until close upon noon, and though it is not easy to find the one point of approach when actually past Villars, the kindly offices of a farmer assisted me through the fir plantations which are rapidly converting the barren hill-sides into useful and agreeable forests, while upon the rough footpath, constructed for the use of the verderers, have sprung up innumerable raspberry-canecanes—now laden with sweet fruit—and plots of scented strawberries. When I finally mounted “the breach,” about eleven o’clock, I was in a state of pleasurable excitement. In the dewy shadows of the forest I had encountered scarcely a butterfly, but the sun was shining full upon the cleft which was surely to be the desired terminus, and now I thought I was likely to be rewarded. The further range of the Dourbes at this point slopes

abruptly away to another valley, bare of trees, the sides well clothed with dwarf conifers and flowering sweet-scented herbs, among which *Erebia*s certainly were to be seen. But, after all, it was only *neoridas* again, and the sky suddenly hazing in with a light misty rain—was ever such ill-fortune?—I reluctantly abandoned the ascent of the Cheval Blanc, which would have taken me perhaps a thousand feet higher. Of course I ought to have ascertained beforehand at what altitude and where *scipio* actually occurs. The small *goante* which I presently encountered on the way back under the cliffs momentarily deceived me, for no sooner had I quitted the tops than out came the sun again. But it was now too late in the day to retrace my steps, and as it was I did not get back to Digne much before six o'clock, stopping to gossip with an old friend on the road, and afterwards, just as I was entering the *octroi*, noticing a fine male *Polygonia egea* seated on a sun-baked rock. This I secured, and another on the wing, though I am bound to say that I struck at a *G. cleopatra*, without seeing the pursuer, which was landed in my net minus the pursued!

The undercliff of the Dourbes also gave me several fair typical females of *C. virgaurea*, and some magnificent *A. adippe* females. Finally, I spent the 19th in the vineyards and on the hills above the cemetery, where the many plants of *aristolochia* with perforated leaves led me to hope that the professional collectors have not yet succeeded in exterminating the dainty *Thais rumina* var. *medesicaste*, which usually I have found here in the spring of the year, but in ever-decreasing numbers. A few broken *Zephyrus quercus* zigzagged among the dwarf oaks, but *Z. betulæ* was not in its former haunt at the top of the path, where I took the only specimen seen this year of *Lampides bœticus*, a male. Indeed, I failed to turn up *betulæ* at all, even in the Eaux Thermales locality, where Mr. Tutt mentions it as having occurred in profusion last year. The August brood of *P. alexis*, moreover, showed little or no local peculiarity, save in the matter of diminished size, and this was the only really common butterfly still on the wing in this locality. So next day I bade adieu to Digne, and returning home leisurely by degrees, and Dijon—round which charming old Burgundian city there is a most likely looking entomological country—I reached London and the end of the summer holidays in the beginnings of the tempests of the 26th.

Since writing the above I have heard from Mr. H. Powell, of Hyères, who has kindly given me permission to publish the following interesting account of the habitats of *Erebia scipio*, from which it may be gathered that although, in one case at least, I was on the right ground for the species, I arrived, generally speaking, too late in the season. He says:—"Scipio in the

Basses-Alpes appears about the middle of July, but one can still get good specimens at the beginning of August, and I took one fresh female as late as August 31st on the Dormillouse Mountain above Seyne at a height of 2300 metres in 1901. In 1899 I found it on a barren mountain close to Allos—between that village and the Cheval de Bois about July 18th, and also on the rocky slopes on the right-hand side of the Verdon, between Allos and Colmars. On July 19th, 1901, I took some males in the Gorge de St. Pierre, Beauvêzer, on the stony slope on the left-hand side going up, just before reaching the precipitous part, and on July 22nd it was fairly plentiful there. Another Beauvêzer locality for it is on the range to the west and north-west, on the steep stony slopes with a little grass, which run up above the forest limit to the precipices supporting the top of the mountains. Here I took several specimens on August 3rd, some of the females being very fresh still, but the males, although abundant, were mostly worn. In 1906 I met with *scipio* on the eastern slopes of the Lausson, between the Lac d'Allos and Entrevaux. The date was July 30th, but I took more specimens there on August 4th. The ground was very bad; masses of loose rock and stones, and very steep. I think this is the only record of *Erebia scipio* in the Alpes-Maritimes."

The following list includes all butterflies taken or observed in the Basses-Alpes between August 1st and the 20th:—

HESPERIIDÆ.—*Carcharodus althææ*; *Hesperia carthami*; *H. alveus* var. *fritillum*, var. *cirsii*, Rmbr., and var. *conyzæ*, Guénée; *H. malvæ* (Allos); *Pyrgus proto*; *P. sao*; *Nisoniades tages* (Allos); *Pamphila comma*; *Thymelicus actæon*; *T. lineola*.

LYCÆNIDÆ.—*Chrysophanus virgaureæ*; *C. hippothoë* var. *eurybia*; *C. alciphron* var. *gordius*; *C. dorilis*; *C. phlæas*, and ab. *eleus*; *Cupido minima* var. *montana*; *Nomiades semiargus*; *Polyommatus damon*; *P. meleager*, and ab. *steveni*; *P. corydon*; *P. bellargus*; *P. hylas*; *P. escheri*; *P. alexis*; *P. eros*; *P. orbitalus* (1); *P. astrarche*; *P. baton*; *P. optilete* (1); *Rusticus argus*, L.; *R. argyrognomon*; *Cyaniris argiolus*; *Lampides bæticus* (1); *Zephyrus quercus*; *Thecla spini*; *T. acaciæ*.

PAPILIONIDÆ.—*P. podalirius*; *P. machaon*; *Parnassius apollo*.

PIERIDÆ.—*Aporia cratægi*; *Pieris brassicæ*; *P. rapæ*; *P. napi*; *Pontia callidice* (Allos); *P. daphidice*; *Leptosia sinapis* var. *chinensis*, and ab. *erysimi*; *L. duponcheli*?; *Colias phicomone*; *C. hyalæ*; *C. edusa*; *Gonepteryx rhamni*; *G. cleopatra*.

NYMPHALIDÆ.—*Dryas paphia*; *Argynnis aglaia*; *A. adippe*; *A. niobe* var. *eris*; *Issoria lathonia* (Allos); *Brenthis euphrosyne*; *B. ino*; *B. amathusia*; *B. dia*; *B. pales*, and var. *arsilache*; *Melitæa phæbe*; *M. cinxia*; *M. didyma*; *M. deione*; *M. par-*

thenie, and var. *varia*; *Pyrameis cardui* (Digne); *P. atalanta*; *Aglais urticæ*; *Polygonia egea*; *P. c-album*; *Limenitis camilla*; *Pararge mæra*, and var. *adrasta*; *P. megæra*; *Satyrus hermione*; *S. alcyone*; *S. statilinus* var. *allionia*; *S. fidia*; *S. actæa*; *S. cordula*; *Enodia dryas*; *Hipparchia briseis*; *H. semele*; *H. arethusa*; *Epinephele jurtina* var. *hispulla* (Digne); *E. lycaon*; *E. tithonus*; *Cænonympha iphis*; *C. arcania*, and ab. *philea* (Allos); *C. dorus*; *C. pamphilus*, and ab. *lyllus*; *Erebria epiphron* var. *cassiope* (ab. *obsoleta*); *E. mnestra*; *E. alecto* var. *glacialis*?; *E. stygne*; *E. euryale*; *E. ligea*; *E. æthiops*; *E. neoridas*; *E. goante*; *E. gorge*; *E. tyndarus* var. *dromus*; *E. lappona* (1); *Melanargia galatea*.

Being representative of one hundred and six species.

DESCRIPTIONS OF A NEW GENUS AND TWO NEW SPECIES OF PARASITIC CYNIPIDÆ FROM BORNEO.

By P. CAMERON.

PARAMBLYNOTUS, gen. nov.

Antennæ stout, thirteen-jointed, the third joint almost as long as the following two united, the last as long as the preceding two united; the intermediate joints more than twice longer than wide. Radial cellule closed on fore margin, more than twice longer than its greatest width; the first cubital cellule closed, the second obsolete, but the nervure is thickened where it ought to be; the cubitus extends to the apex of the wing; the nervures are thickened. Eyes bare, placed on the upper part of the head, the malar space being somewhat longer than them. Cheeks margined. Ocelli prominent. Scutellum large, not much raised over the mesonotum, broadly rounded at the apex. Metanotum irregularly reticulated. Abdomen lenticular, sessile, the second segment is a little longer than the third, which is of about the same length as the fourth, the fifth is as long, dorsally, as the basal segments united; the sixth about one-third of its length. Legs stout, the hind coxæ and femora greatly thickened, the coxæ almost twice the thickness of the femora. Calcaria short, as long as the width of the apex of the tibiæ; the claws long, thin, curved. There are indistinct parapsidal furrows. The temples are short; the occiput is margined and is rounded inwardly. The male has the antennæ as long as the body (in the female it is as long as the head and thorax united) and fourteen-jointed; the third joint is straight, and is distinctly shorter than the fourth; the last is not much longer than the penultimate. The head and thorax are strongly punctured; the punctures on the latter are deep, round. There is a wide crenulated furrow below the middle of the mesopleuræ; the mesosternum is bordered by a ridge, the collar is also bordered by a stout ridge. The hind legs are stouter and their coxæ longer than usual.

The relationship of this genus is with *Amblynotus*, Htg.; that genus has the antennæ filiform in the female, and in the male they have the third joint incised: the basal two abdominal segments are equal in length; the thorax is only finely granulated, the thorax is not rugosely punctured, the abdominal petiole is smooth, and there is a distinct areolet.

Paramblynotus punctulatus, sp. nov.

Black; the mandibles, the four anterior knees, the tibiæ except behind, and the tarsi testaceous, the wings hyaline, the first cubital and the radial cellule clouded, the nervures black; the face, cheeks, and the mesopleuræ behind covered with white pubescence; there is a patch of depressed white pubescence on the base of the mesopleuræ above; the apical segments of the abdomen are fringed with long white hair; legs densely covered with white pubescence; face closely, rugosely punctured, the front and vertex are more strongly punctured; the punctures deep and sharply margined. Except on the mesopleuræ the thorax is strongly, deeply, thimble-mark-like punctured; the mesopleuræ smooth and shining, except behind; there are a few irregular punctures on the apex. Metapleuræ densely covered with white pubescence, rugosely punctured, and with an oblique squarish area in the centre of the base. The eyes are surrounded by a crenulated border. Antennal scape shining, the flagellum bare, opaque. ♀. Length, 5 mm.

Kuching, Borneo (John Hewitt, B.A.). A stoutly built species.

The foveæ at the base of the scutellum are large, square, smooth, shining, roundly depressed and separated by a narrow but distinct keel. The basal abscissa of the radius is straight, oblique, about one-third of the length of the apical and distinctly thicker than it. The apical slope of the metanotum is smooth above and below, and with two rows of large foveæ in the middle.

Paramblynotus ruficeps, sp. nov.

Black; the head and pronotum red, the tegulæ of a darker red; the tarsi and the four anterior tibiæ rufo-testaceous, the posterior tarsi darker than the others; antennæ as long as the body, the scape rufous, the flagellum black; wings hyaline, the nervures black, the radial cellule clouded along the edges; the nervures black. ♂. Length, 3 mm.

Kuching, Borneo (John Hewitt, B.A.).

The sculpture of the head and thorax is pretty much as in *P. punctulatus* described above, but the apical slope of the metanotum is very different; it is surrounded by a stout keel, rounded above; the upper half of the area formed by it is opaque, and is bordered below by a stout transverse keel; the lower part is shining and has a few longitudinal striæ. The first segment of the abdomen is clearly separated, and is stoutly, longitudinally striated.

MELITÆA AURINIA, &c., AT BARCELONA.

By W. G. SHELDON, F.E.S.

JOURNEYING down to Andalusia last spring, I rested for a few days at Barcelona, and whilst there put in two mornings, April 6th and 7th, on the slopes of the suburb of Tibadabo amongst the butterflies.

The climate of Barcelona in the spring resembles that of the French Riviera, and the majority of butterflies found are common to both; my observations, however, would seem to show that at Barcelona the emergence is a week or two earlier than on the "côté d'azur," such species as *Thestor ballus* and *Nomiades melanops* being practically over at the time of my visit.

The number of species observed in the imago stage was only twelve, and consisted of *Polyommatus alexis*, *Colias edusa*, *Euchloë euphonides*, *Pararge megæra*, *Anthocharis belia*, *Pieris rapæ*, *P. brassicæ*, *Cænonympha pamphilus*, *Thestor ballus*, *Thecla rubi*, *Nomiades melanops*, and *Euvanessa antiopa*.

My chief object, however, at Tibadabo was to make a search for the larvæ of the fine Spanish form of *Melitæa aurinia* var. *iberica*, the imago of which, a few years ago, Messrs. Jones and Standen had found there later on in the season.

After prospecting the neighbourhood, I came to the conclusion that the waste ground round the foot of the inclined railway which takes one up to the summit, and which has an altitude of perhaps 1000 ft., was a likely spot; but a search of two hours or so on the first morning of all the likely food-plants I could discover, including various species of *Centaurea* and *Scabiosa*, one of which closely resembles the favourite pabulum of the species at Hyères, if not actually it, was a total failure; and except for an odd pupa found under an overhanging rock I did not see any signs of my quest on that day. The next morning, immediately on commencing to search on the same ground, I found a full-grown larva at rest on a *Centaurea* plant, which, however, did not show signs of having been eaten. For a long time this was my only success, and I was on the point of giving up when my attention was directed to a trailing climber covering a large hazel bush eaten wholly bare of leaves by some larva. But an adjoining bush was overgrown by the same climber, which I then saw was a species of *Lonicera*, very like, and probably identical with, the *Lonicera* which is the usual pabulum of *Limenitis camilla*. This at once called to my recollection that Canon Zapater, in his 'Catalogue of the Lepidoptera of the Province of Teruel,' speaks of a small race of *M. aurinia* found near Albarracin, the larva of which feeds upon *Lonicera*, one species of which is of course often used as a captivity food-plant of this species in Britain. This hint very soon led to my finding a batch of larvæ of un-

doubted *M. aurinia* on a *Lonicera* bush, and further search on adjoining bushes revealed the fact that the larvæ were in enormous numbers, and I suppose I must have seen on a space of one acre several thousand examples of all sizes, from half-grown to those ready to pupate. I contented myself with some five dozen of the largest; and these emerged whilst I was at Granada in the middle of May.

From the above observation, with Zapater's note, it would appear that the natural food-plant of *M. var. iberica* is *Lonicera* sp., and not the more usual plants frequented elsewhere than in Spain.

The resultant imagos are the most brilliant terra-cotta forms I have seen of *M. aurinia*, the intensity of the terra-cotta in some of the examples being quite startling and most beautiful. Judging from the extensive series in the British Museum, which does not contain anything so brilliant in colour as my Barcelona specimens, I should call them an extreme form of *M. var. iberica*.

Youlgreave, South Croydon: Oct. 28th, 1908.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

(Concluded from p. 270.)

THUS in the Rhone Valley, at some 1500 ft. above the sea, *parthenie* is of average size (about 36 mm.), and there is little difference between the two broods; above Caux, at some 3500 ft., where it has become single-brooded, it is very noticeably larger; whilst round Bérissal, at a little over 5000 ft., the specimens are smaller than in the Valley. (*Varia*, by the way, does not begin to appear till some 1200 or 1500 ft. higher still.) In accordance with the same rule, in the lower parts of the Jura, where *parthenie* is still double-brooded, both broods are decidedly smaller than in the Rhone Valley. On the other hand, as one would expect, the mountain forms of *athalia* and *dictynna* are, as a rule, progressively smaller than those of the plain. The difference in the size of *aurelia* in the Rhone Valley and in the mountains is not noticeable, and the advantage is, if anything, on the side of the mountain specimens, but this apparent exception is in reality merely a confirmation of the rule, for the feeding-time of the larva is made as long or longer in the mountains by the great difference between the times of emergence at different altitudes, this species appearing late in May at Sion, at the end of June below Bérissal, and not until late July at Zinal—a much greater

difference than is usually caused by altitude in other species. What has been said of altitude is also true, in a general way, of latitude, but in both cases there are various further points to be taken into consideration, such as the suitability of the environment to the food-plant, the length of time which the snow generally remains, the amount of possible daily sunshine, the chilling effect of the near neighbourhood of glacier-torrents, &c. It is possibly in connection with the first of these considerations that *athalia*, in the neighbourhood of the Italian Lakes, is smaller than the usual mountain form, those from Cadenabbia, for instance, being smaller than specimens from Faido far up the Leventina. It seems hardly possible that my specimens from the former locality, taken towards the end of July and not very fresh, could belong to a second brood; and, indeed, Rühl has remarked on the smallness of the Tessin and Lombardy specimens as compared with those from further north. With very few exceptions it is useless to give definite rules for the times of appearance of the different species, in consequence of the great extent of the habitat of many of them both in altitude and latitude. Such rules as can be laid down must be vague and comparative. It may, however, be said that *asteria* and *varia* never descend low, probably not below 6000 ft. at most, while *britomartis* and *deione* never mount high, nor does the latter go far north, the Rhone Valley being quite its limit. *Asteria* is to be found from the beginning of July till at least the middle of August, and *varia* from the middle of July for about a month. *Parthenie* emerges before *athalia*, and in the plains is generally over when the latter appears, but the higher or the further north one goes, the more they may be expected to overlap, though, in my experience, *parthenie* is always the earlier, even where it is single-brooded. In the Rhone Valley it may be expected about the middle of May, and again about the middle of August. In the same district *aurelia* appears a few days later, *berisalensis* and *dictynna* at the beginning, and *athalia* in the middle of June, the first-named appearing again about the third week in August or a little later. *Britomartis* at Reazzino appears fairly early in June and at the end of July. From these dates it can be more or less calculated at what time the emergence of a species may be expected as we rise higher or advance further north, though, as previously stated, many local circumstances, as well as the forwardness or otherwise of the season, must be considered. It may also be added that, with the exception that *deione* appears in South France in May, none of the species can be expected to appear further south much earlier than their Rhone Valley dates; altitude has, moreover, in general a more retarding effect than latitude.

WING-MARKINGS ARRANGED IN TABULAR FORM.

	DEIONE.	Var. BERISALENSIS.	ATHALIA.	PARTHENIE.	VAMA.	AURELIA.	BRITOMARTIS.	DICTYNNA.	ASTERIA.
Up. s.f. Border.	Sometimes divided.			Sometimes divided.		Often divided in ♀.	Often divided.		
Lunules.	3rd projects noticeably inwards.	3rd projects noticeably inwards. Small.	3rd projects noticeably.	3rd does not project noticeably.	Replaced by quadrate spots. 3rd rarely projects at all. In ♀ sometimes mere dots.	3rd projects noticeably.	Distinct but narrow; lowest often missing. 3rd projects.	Often all but 3rd suppressed, especially ♂; sometimes all.	Light; generally quadrate spots. 3rd rarely projects and often is not the largest.
Sub-minimal lines.	Fine and distinct; inner almost straight in lower two-thirds.	Inner as in <i>deione</i> .	Both usually rather thick. Inner bowed inwards and again outwards in lower two-thirds.	Further apart than in other species; inner, when distinct, nearly straight in lower two-thirds.	Inner in ♀, and in ♂ when present, only slightly bowed out near costa, and thence nearly straight.	Generally broad in ♂. Inner less bowed at costa than in any other but <i>varia</i> and <i>britomartis</i> , and bends slightly outwards at inner margin.	Inner approaches most in shape to <i>curvica</i> , but on the whole the straightest of the group.	Outer often more or less coalescent with border. Inner broad and nearly as much bowed as in <i>athalia</i> .	Outer rather sharply angled outwards nearly half-way down; inner not much bowed inwards.
Elbowed line.	Fine but continuous, not usually much bowed inwards.	Not much bowed inwards.	Very much bowed inwards.	Sometimes only costal third present, running in to inner subterminal.	Much straighter than in any other species.	Moderately curved; sometimes runs into inner subterminal.	Variable, moderately curved; costal part sometimes joins inner subterminal.	Moderately curved; very broad, or included in suffusion.	Thick and much bent. Sometimes appears to run into inner subterminal.
Marginal blotch.	Very variable, shaped like <i>x</i> or <i>y</i> placed sideways, or some part of this form.	Shaped like <i>x</i> , or <i>y</i> placed sideways.	Variable; often large and thick, sometimes almost wanting.	Generally small.			Broad and thick; sometimes a black <i>x</i> or a black blotch containing an <i>x</i> of ground colour.	Generally included in suffusion.	Very variable, sometimes even as in <i>berisalensis</i> .

	DEIONE.	Var. BER- SALENSIS.	ATHALIA.	PARTHENIE.	VARIA.	AURELIA.	BRITOMARTIS.	DICTYNNA.	ASTERIA.
Stigma.	Outlined; more or less oval.	Oval; out- lined.	Long and nar- row; often filled with black.	Circular, oval, or reniform; nearly always outlined.	Large, outlined in ♂; in ♀ gener- ally filled with dark.	Clearly defined and enclosing darker shade of ground colour.	As in <i>athalia</i> , but rarely filled with black.	Rather narrow; nearly always filled with black.	Very variable in shape, outlined or filled in.
Basal lines.	Distinct on both sides of median ner- vure.	As in <i>deione</i> .	Only conspicu- ous above me- dian nervure. Space between often black.	Upper part fairly conspicuous; oft- en forming a reni- form stigma.	Upper part fairly distinct. In ♀ encloses dark scales.	Generally en- closes a darker shade.	Strongly marked; sometimes en- closed space is black.	Generally includ- ed in suffusion; when visible filled in with black.	Often included in suffusion, if not, filled in with black.
Up. s. h. w. Bor- der.	Rather broad.	Very broad, often nearly filling lunu- les.		Sometimes divid- ed as in f. w.	Broad and suffused in ♀.	Often divided, especially in ♀.	Less often divided than in the f. w.	Broad and suf- fused.	Occasionally slightly divided.
Outer line.	Narrow, often very fine.	Often joins the border.	Sometimes en- croaches on the lunules. Very variable in breadth.		Clearly defined in ♂, thick and suf- fused in ♀.		Very variable in breadth.	Often obscuring the lunules in ♂, less often in ♀.	Generally thick.
Inner line.	Less fine than outer.	Clearly de- fined.	Very variable in breadth.	Usually further from outer than in other species.	Sometimes clear in ♂, oftener in- distinct. In ♀ like outer.	Usually much broader than outer.	Very variable in breadth.	Very rarely clear.	Generally thick.
Extra line.	Complete and generally double; rarer fine.	Complete and clearly de- fined.	Frequently ab- sent.	Rarely indicated except in centre.	Lower half usually indicated in ♂; not in ♀.	Present but often included in basal suffusion.	Upper part gener- ally clear of suf- fusion.	Very rarely visible.	Covered by suf- fusion.
Discal spot.	Often con- tinued into a band.	Generally joins extra line and makes a spot of ground colour.	Sometimes ab- sent or includ- ed in basal suf- fusion.	Rarely indicated.	Rarely present in ♂, never in ♀.	Generally present, but often includ- ed in suffusion.	Generally clear of the suffusion.	Invisible.	Invisible.

	DETONE.	VAR. BERTSALENSIS.	ATHALIA.	PARTHIENIE.	VARIA.	AURELIA.	BRITOMARTIS.	DICTYNNA.	ASTERIA.
Basal spot.	Inconspicuous, being often part of a band.	Inconspicuous, often forming part of a band.	Generally circular and very conspicuous.	Inconspicuous, often double.	Generally covered by basal suffusion.	Double, generally visible in ♂, sometimes in ♀.	Clear and generally conspicuous.	Rarely visible, but sometimes distinct in ♀.	Generally covered, but sometimes conspicuous.
Basal suffusion	Scarcely any.	Almost confined to lower half of wing.	Often includes extra line and discal spot.	Almost confined to lower half of wing or nearly absent.	Large in ♂, often reaching to inner line in ♀.	Frequently in ♂ and nearly always in ♀ encloses extra line and discal spot.	Rarely including more than lower part of extra line.	Nearly always in ♂, and often in ♀ extending to inner line at least.	Includes extra line and discal spot.
Un. s. f. w. Border.	Inner edging line often bears flattened triangular spots.	Inner edging line forms series of black lunules.	Inner edging line more or less arched between nervures.	Inner edging line scarcely arched.	Inner edging line barely visible in ♂, sharply angled in ♀.	Inner edging line very indistinct; only arched in 3rd space above anal angle.	Inner edging line arched or angled.	Inner edging line much angled.	Only one edging line, the outer.
Lunules.	Very narrow and inconspicuous.	Very light, especially at costa.	Light, especially at costa.	Most are pale.	Only light at costa in ♂, all in ♀.	Light, especially at costa.	Narrow but light and clearly marked.	Usually much lighter than border.	Rather squared and very light.
Subterminal lines.	Both very narrow; outer broadest at anal angle, inner only at costa.	Outer most conspicuous at anal angle, inner only at costa.	Outer very conspicuous at anal angle, inner only dots at costa.	Outer scarcely more conspicuous at anal angle; inner often clear throughout.	Outer generally indistinct and inner absent in ♂; outer distinct and inner visible in ♀.	Outer clear and dark, inner very indistinct except at costa.	Outer conspicuous but rather suffused; inner pronounced in ♂, visible in ♀.	Outer a dark suffusion, especially at anal angle, inner generally visible as a darker shade.	Outer shows as edging to lunules, inner at least as a darker shade.
Elbowed line.	Generally 4 costal spots.	4 costal spots.	3, 4, or more costal spots.	3 costal spots; sometimes traceable throughout.	Very distinct costal spots in ♂; slight or absent in ♀.	Costal spots or rings.	Distinct and pronounced through entire length.	Usually costal spots.	Sometimes only on margins, sometimes distinct throughout.
Marginal blotch.	Generally a small black streak, but sometimes x, Y- or V-shaped.	Generally x-shaped.	Very variable.	Small, pointing upwards.	Very distinct in ♂, small or absent in ♀.	Distinct.	Not large, often Y-shaped.	Generally visible, often clear, not large.	Very variable as on up. s.

	DEIONE.	Vat. BERI-SALENSIS.	ATHALIA.	PARTHENTIE.	VARIA.	AURELIA.	BRITOMARTIS.	DICTYNNA.	ASTERIA.
Basal marks and stigma.	Generally faint.	Generally faint.	Distinct, stigma narrow.	Lower part of stigma and upper of lines clear. Basal dash often conspicuous in ♂.	All black and distinct in ♂, especially basal dash. Generally absent in ♀.	All generally distinct in ♂, less so in ♀.	All clear and pronounced. 3 basal lines.	All clear and distinct, even in absence of other marks. 3 basal lines.	All clear.
Un. s. h. w. Terminal band.	Inner edging line of border slightly angulated, often faintly marked.	Row of black lunules on inner edge of border.	Both edging lines of border more or less arched.	Both edging lines of border more or less arched. Very variable.	Edging lines scarcely, if at all, arched.	Inner edging line of border very slightly arched.	Inner edging line of border angled or arched. Lunules vary much in size.	Inner edging line of border arched, especially at costa.	Only outer edging line. Band very broad.
Outer band.	Orange lunules bordered with yellow. Upper part scarcely less distinct.	Upper spots only slightly less distinct.	Upper spots conspicuously lighter.	Upper spots more undecided pattern.	Upper spots scarcely differ from the rest. Lunular part narrow in ♀.	Lunular part narrow and flattened. Much lighter than in other species.	Dark spots in lunules. Pattern interrupted towards costa, generally very markedly.	Dark spots in lunules. Pattern somewhat interrupted towards costa.	Very variable in form, proportion of parts, and colour.
Central band.	Both parts of the same shade. 3rd and 4th spots project somewhat outwards.	Both parts of the same shade. 3rd and 4th spots project somewhat.	Inner part the darker, outer of shade of terminal lunules. 3rd and 4th spots often project considerably.	Inner part darker than outer. Latter of shade of terminal lunules. 3rd and 4th spots often project considerably.	Inner portion darker and of same shade as terminal lunules. Breadth of two parts very variable. 3rd and 4th spots project somewhat.	Inner portion darker, outer of shade of terminal lunules. Breadth of two parts very variable. 3rd and 4th spots project somewhat.	Inner portion darker, outer of shade of terminal lunules. 3rd and 4th spots greatly projecting sometimes quite outside the rest of the row.	Inner portion darker; outer of shade of subterminal lunules. 3rd and 4th spots project often rather conspicuously.	Unicolorous; the black dividing line slight or even absent.
Inner band.	Light spot roughly triangular.	Light spot very variable, but not triangular.	Often ill-defined. Light spot small and narrow.	Often ill-defined. Light spot small and narrow.	Well-defined. Light spot small or absent in ♂, but not in ♀.	Light spot small.	Often noticeably broad in centre, and light spot large.	Light spot variable, but rarely very large.	Not generally broad in centre. Light spot very variable.
Basal band.	Central spot generally small in ♂; 5th absent.	Central spot very small; 5th absent.	Central spot very variable in size.	Central spot small.	2nd and often 4th spots conspicuously large.	5th spot usually present.	Central spot rarely conspicuously small.	Central spot rarely noticeably small.	2nd spot conspicuously the largest.

NOTES AND OBSERVATIONS.

MALACOSOMA NEUSTRIA ab.—As the process block, reproducing the photograph of this interesting aberration of *M. neustria*, did not print clearly in the text (*antea*, p. 257), Messrs. West, Newman & Co. have very kindly reprinted the figure on plate paper. The curious way in which the central lines of the fore wings run together below the middle can now be plainly seen. It may be mentioned that somewhat similar aberration in the transverse lines has been noted in *M. castrensis*.

ACIDALIA HUMILIATA REARED FROM OVA.—I think it is perhaps worth recording that I have recently bred *A. humiliata* from ova to the perfect insect, two lovely specimens emerging about a fortnight ago. I took the insect during my stay at Freshwater in June, and succeeded in getting some fifty or sixty ova. They fed up well until about half-grown, and then appeared to be undecided whether to feed up or hibernate; a few chose the former, and I sent a couple of full-grown larvæ to be figured, and two imagines emerged as before stated. I am afraid the remainder will not survive the winter.—R. TAIT, Jun.; Roseneath, Ashton-on-Mersey, Cheshire.

THE HYBERNATION OF GONEPTERYX RHAMNI.—In 1904 I sent you a note on this subject (see Entom. xxxvii. 141), in which I surmised that a female specimen I found sitting exposed on *Jasminum nudiflorum* on the morning of January 17th had crept out from some neighbouring ivy to which she had retired for her winter sleep. The truth of this hypothesis was curiously confirmed on October 29th, 1908. At 11.0 a.m. in brilliant sunshine I noticed a very fine and perfect female *G. rhamni* fluttering around some ivy on the south side of my house. I sat down on a garden-seat close by and watched her carefully. She spent ten minutes in basking on the ivy-leaves, or on those of *Vinca major* growing in a bed beneath, flying occasionally round the sunless eastern corner, evidently examining the ivy with which it is covered. Into a fairly large gap in this ivy she finally retired at 11.10 a.m.; there no doubt to pass through a period of torpidity not likely to be broken by the feeble wintry heat of eastern suns.—Rev. G. H. RAYNOR; Hazeleigh Rectory, Maldon.

NEPTICULA ACETOSE IN SURREY.—Reading in last month's 'Entomologist' (p. 254) that at a meeting of the South London Entomological Society Mr. Sich exhibited mines of *Nepticula acetosæ* from Surrey, I walked over to the nearest station for its food-plant, about a mile from here, and, after a short search, found the unmistakable circular blotch-like mines of this most diminutive creature; they were, however, by no means common. I found seven or eight after half-an-hour's search. How often is one tempted to go a long railway journey in search of some desirable species when it may sometimes be found close to one's door!—A. THURNALL; Thornton Heath, November 5th, 1908.

SYRPHIDS KILLED BY FUNGUS.—Once or twice at the end of September and beginning of October last on Esher Common, Surrey, I met with several dead Syrphid-flies, *Melanostoma scalare*, Fabr., on the

flower-heads of the tall grass, *Molinia cærulea*, Mönck. Apparently all that were brought away were females. They were found to have fallen victims to a fungus-parasite, *Empusa muscæ*, Cohn. It was rather curious that the flies were often attached to the grass by the anterior point of the head only.—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames.

TORTRIX PRONUBANA ON YET ANOTHER FOOD-PLANT.—In a garden where I had previously taken *Tortrix pronubana* on *Euonymus*, I found, in September last, three *Tortrix* larvæ feeding in rolled leaves of *Chrysanthemum*, on which plant they readily fed up, and ultimately produced *T. pronubana*. Although the species is known to affect a wide range of food-plants on the Continent, it appears to have been previously found only on *Euonymus* in this country, and so far as I am aware this is the first instance of it having been found wild on any of the Compositæ.—ROBERT ADKIN; Lewisham, November, 1908.

COLIAS EDUSA, &c., NEAR EASTBOURNE.—It was not until August 30th that I had the chance of looking after the butterflies on the south-east corner of the South Downs. By this time the "season" was practically over in that neighbourhood, the stormy weather of the latter half of the month having put the finishing touches to a somewhat early summer. However, that day happened to be a very fine one, and in the course of a ramble of a couple of hours' duration some six examples of *Colias edusa* came under my notice; all of them, with the exception of one that evaded both capture and examination, proved to be males in more or less battered condition. One youngster that I met confessed to having taken nearly a score on one day earlier in the month, and during my subsequent peregrinations one or two specimens were seen almost daily until September 19th. The only one that I definitely ascertained to be a female was taken on September 11th, and was in an equally dilapidated condition as the males. Among the other "alien" species, *Vanessa atalanta* was fairly frequent; anything from one to four or five individuals were to be seen on any day up to September 7th, when I left the neighbourhood; but during the whole of my stay I saw only some half-dozen examples of *Cynthia cardui*. *Plusia gamma* was always common but never abundant, and only one example of *Nomophila noctuella* was met with.—ROBERT ADKIN; Lewisham, November, 1908.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA IN CUMBERLAND.—A male specimen of *C. edusa* was captured on October 13th last, near this city.—M. C. DIXON; 208, Warwick Road, Carlisle.

ACHERONTIA ATROPOS IN THE CO. WATERFORD.—A fine specimen of the Death's-head hawk-moth was taken about two miles from here, on the 9th October last, and given to me. It was alive when I received it, but although I listened attentively for its cry or squeak, it never uttered one. It must have only just emerged from the pupa when captured, as the wings were quite fresh and perfect.—(Rev.) WILLIAM W. FLEMYNG; Coolfin, Portlaw, Co. Waterford.

ACHERONTIA ATROPOS IN LANCASHIRE.—A female specimen of *A. atropos* was captured here on October 9th last, and another example of the same sex on the 16th of that month.—T. BAXTER; Min-y-don, St. Anne's-on-Sea.

PÆCILOCAMPA POPULI IN OCTOBER.—I took a specimen of *P. populi* from off a street-lamp here, on October 23rd last. Is not this a very early date?—EDWIN P. SHARP; 1, Bedford Well Road, Eastbourne.

[This species is perhaps more frequent in November and December, but it has been met with by others in the month of October.—ED.]

PYGÆRA ANACHORETA IN ESSEX.—I see in 'Entomologist' for October, p. 250, that Mr. George P. Kitchener records the occurrence of this species at Clacton, and observes that it appears to be a new locality for the species, so he and other readers of your magazine may be interested to hear of a previous capture in this county. On September 26th last year, when beating for larvæ in a wood in this neighbourhood, I found half a dozen larvæ of what I thought were *P. curtula*, spun up between leaves of aspen. They were rather small, and I did not examine them very carefully. When I got home they were sleeved on a branch of a poplar-tree in my garden, and left there until they had become full-grown and had spun up, when the cocoons were removed and placed in one of my breeding-cages. From these, the following May, I bred two *P. anachoreta*, both males; one *P. curtula*; and three *P. reclusa*.—GERVASE F. MATHEW; Dovercourt, Essex, November 3rd, 1908.

LEUCANIA VITELLINA IN SOUTH DEVON.—This species was taken rather freely here during September. My brother has captured some, and a Paignton collector informs us that several were secured in his neighbourhood. This is the first year we have seen more than one specimen during the season.—J. WALKER; 3, Goodwin Terrace, Carlton Road, Torquay.

AGROTIS LUNIGERA IN NORTH WALES.—I have to record the capture, at sugar, of two specimens of *A. lunigera*, at Penmaenmawr. This I believe to be the first record for the species in that locality, although I have taken it before at Abersoch.—R. TAIT; Ashton-on-Mersey, Cheshire.

AGROTIS CINEREA IN ISLE OF WIGHT.—*A. cinerea* was taken in larger numbers than usual at Freshwater this year, though they were already showing signs of wear when I arrived on June 11th. I have also had some success in breeding *A. agathina* this year, finding that the larvæ reared in a frame exposed to sun and with plenty of side ventilation did much better than those reared in partial shade and with top ventilation only; many of these went mouldy whilst in pupa.—R. TAIT, Jun.

EPUNDA LICHENEA IN SUSSEX.—This species has occurred sparingly in the neighbourhood of Eastbourne this season; one at light on October 1st, and a female at ivy on the 14th. I obtained about one hundred ova from the latter. A previous occurrence at Abbots Wood, some years ago, is recorded, but with no further data, and I have heard of none since.—EDWIN P. SHARP; 1, Bedford Well Road, Eastbourne, Sussex, October 24th, 1908.

TÆNIOCAMPA STABILIS IN NOVEMBER.—On the evening of Nov. 5th I was much surprised to come across a specimen of *T. stabilis* on ivy bloom. I do not recollect ever having previously taken this species in the autumn.—EDWARD GOODWIN; Canon Court, Watlington.

[Barrett mentions a specimen of *T. munda* that had been taken at ivy in October, at Chesham in Bucks; he adds, "it is the size of *T. stabilis* but well marked."—Ed.]

CIRRHOEDIA XERAMPELINA IN SURREY.—As this species has rarely been recorded from Surrey, I may mention that I captured three fine specimens at light, on Kingston Hill, September 14th and 16th last. One female I sleeved on ash in the garden here, and she deposited a number of eggs, several on the gauze of the sleeve in which she was enclosed. During the last three years I have taken altogether about eight specimens of *C. xerampelina*, and I have heard of others captured in the neighbourhood, both this year and in 1907.—PERCY RICHARDS; Wellesley, Queen's Road, Kingston Hill.

CAPTURES AT LIGHT, KINGSTON HILL, SURREY.—Many species have been plentiful this autumn, among which may be mentioned, *Ennomos fuscantaria*, *E. alniaria* (*tiliaria*), and *E. quercinaria* (*angularia*). Of *E. erosaria* I have only seen two specimens.—PERCY RICHARDS; Wellesley, Queen's Road, Kingston Hill.

DRAGONFLIES ON THE NORFOLK BROADS.—I was on the Broads for a few days about May 30th this year. *Orthetrum cancellatum* was well out and in good numbers along the dykes, on the plank bridges over which it is very fond of basking. *Cordulia aenea*, *Libellula quadrimaculata* (very variable in this district), *Brachytron pratense*, and *Erythromma najas* were also observed. *Æschna isosceles* was just appearing, as also was *Libellula fulva*. I visited the Broads again from June 18th to 24th. The weather was very bright and sunny, though rather windy. Dragonflies were abundant. *O. cancellatum* were swarming, and where the fen had been cut along the dyke-sides were to be found basking on the dry grass, &c. *L. fulva* and *Æ. isosceles* were in good numbers, but appeared to keep more to the main streams, hawking along the edge of the reed- and typha-beds. They are very wary and difficult to approach, and it is not an easy matter to net them from a boat. Late one afternoon we found several *Æ. isosceles* hawking about the sunny side of a large alder carr standing back from the river, which was sheltered from the wind, where also some females of *L. fulva* were observed. Females of *L. fulva* when first out seem to be partial to the open fen, often a long way from the main stream. They hawk round the small clumps of sallow and alder and are easy to catch, but if one is seen along the river it is generally rather battered, and is busy laying eggs, which are dropped at random into the water. *O. cancellatum* also flies when laying, and just touches the surface with the end of its abdomen. *Æ. isosceles* rests on some floating rubbish, and thrusting its abdomen beneath the water appears to place its eggs carefully.—H. M. EDELSTEN; October 20th, 1908.

ACRONYCTA AURICOMA AT DOVER.—On the principle of "better late than never," I wish to record that I took two wasted specimens of *A. auricoma* in a wood near Dover on the same tree at sugar on

June 13th, 1907. I did not think the capture worth recording at the time, but when I mentioned it to a correspondent he proved sceptical, saying that very few *A. auricoma* had been taken in the last twenty years, and suggesting that they might be a form of *A. rumicis*. This insinuation sent me with the specimens to Mr. Sidney Webb, who reassured me as to their identity. I gathered from him that Dover might be a new locality for the species. Curiously enough, the wood in question is that in which the specimen of *C. alchymista* recorded in 'Barrett' (vi. 232) was taken, and it was Mr. Webb's kindness in telling me of the locality that induced me to sugar regularly there. Needless to say, I have not found *C. alchymista* yet, nor have I seen anything more of *A. auricoma*, although I worked hard for a second brood in 1907, and for both broods this year.—(Capt.) P. A. CARDEW; St. Aldwyns, Park Avenue, Dover, November 18th, 1908.

ACHERONTIA ATROPOS IN HERTFORDSHIRE.—I had a larva of *A. atropos* brought me in August by some children who found it in Grove Road, Hitchin. This duly pupated, and a perfect insect emerged on November 1st. Another larva dug up in a potato-field was unfortunately injured and died.—R. C. GRELLET; Orford Lodge, Hitchin, Herts, November 18th, 1908.

ÆSCHNA MIXTA IN SUSSEX.—Our friend Mr. H. J. Watts, of Westminster, has been kind enough to show us a pair of *Æschna mixta* which he took at Pulborough on October 4th last. Both the specimens were very fully matured, and the wings of the female were somewhat frayed. Mr. Watts tells us that they alighted on a grassy spot, and were secured together by placing the net over them.—F. W. & H. CAMPION; Walthamstow, November 17th, 1908.

BOMBYX QUERCUS ASSEMBLING.—I had a somewhat curious experience with this moth during a fortnight's holiday spent at Treburrick, a small Cornish village lying about midway between Padstow and St. Columb, in the middle of August last year. Accompanied by my family and relatives, we set out for a walk, one dull, damp afternoon, to a small neighbouring village known as "Shop," and situated some three miles away. Our route lay along picturesque lanes, the high rocky banks of which were clothed with ferns, wild flowers, bramble, &c., and offering from time to time, through the gaps and gateways in the hedges, glorious views of the sea. My youngest son, ever on the look-out for captures, was fortunate enough to espy a freshly emerged "oak eggar," its wings not yet grown, crawling up a lichen-covered rocky bank. This he quickly secured and placed in a two-inch glass-bottomed box, and, to allow the wings to properly develop, the box was kept uncovered. Carried in this way the moth's wings gradually expanded to their full size, but owing perhaps to the prevailing moist air, or the motion caused by travelling, they remained weak and flaccid for a considerable time. On reaching "Shop" I had occasion to leave my people for a few minutes while I obtained some stamps at the village post-office, and on returning I found them in a great state of commotion. Their excitement was caused by the antics of a bright-coloured moth which persisted in flying at and settling upon my sister, who at this time was carrying the female "eggar" in the open box. I quickly took in the situation and

realized that the visitor was a male of the same species attracted by the female, and without loss of time I proceeded to box him as he sat upon my sister's waterproof cloak. Before I had time to do so, however, another male came up and then another and another, each flying with rapid gyrations around the object of their visit and eventually settling upon the aforesaid cloak. These were boxed in the same way as the first. To avoid the villagers, whose curiosity our proceedings had aroused, we passed farther along the road and quickly rigged up a net ready for fresh arrivals. For the next half-hour or so, slowly walking along the lanes with occasional stoppages, we had, at intervals of every few minutes, fresh visitants who came flying up against the wind and making for the person at the time holding the boxed female; most of these we were able to net, but some were too active for us. The afternoon drawing to a close, and the moths getting scarcer, we turned homewards, full of our adventure. On reaching our lodgings I placed the female in a cardboard box having a gauze-covered top, and as evening closed in I set out with her, accompanied by my two boys, and anticipating a renewal of our recent experiences; in this, however, I was disappointed, for not a single *quercus* put in an appearance. The next morning was too wet for walking, but in the afternoon the weather improved, and replacing the female in a glass-bottomed box, we made another excursion in quest of males. To our delight we had a renewal of our previous afternoon's experience, the males soon appearing, but in greater numbers than before, and furnishing us with plenty of sport as they came flying up against the wind and careered wildly around the boxed female; at times we had five or six to deal with at once. We soon netted a considerable number, but as the novelty wore off we became less enthusiastic in their pursuit. On returning to our lodgings we found our landlady full of excitement, for in our absence our living room had been invaded, by way of the open window, by a small swarm of male "eggars," attracted by the gauze-covered box in which the female *quercus* had passed the previous night. Although inexperienced at the game our landlady had managed to make more than a dozen captures.

During the remainder of our holiday—a further ten days or so—the female "eggar" accompanied us on most of our excursions, and our previous experiences with her were each time repeated, except that from day to day her attractive powers became gradually but perceptibly weaker. The males therefore came in lessened numbers and were more difficult to net. A few days before the end of our stay she was accidentally crushed to death, but even then still retained a limited power of attracting the males, and this power was also shared by any empty box in which she had been placed. The scent given out by the female is of a musty foxy description and quite apparent to me, and with hardly a doubt is the means by which the males are attracted. I had previously been under the impression that *quercus* flew during the evening, but our experience was to the contrary; we never saw a single male fly except during the afternoon, although we occasionally saw a female flying in the evening. We had the good fortune to find another freshly emerged female on another rocky bank, but this was

killed as soon as developed, to occupy a place in the cabinet later.—A. J. WINDYBANK; Latchmere, Richmond Road, Kingston-on-Thames, October 14th, 1908.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 21st, 1908.*—Mr. C. O. Waterhouse, President, in the chair. — Monsieur Charles Oberthür, of Rennes, France, was elected an Honorary Fellow of the Society.—Mr. Charles B. Autram, of the Insectarium, Kanny Koory, Silchar, P.O., Cachar, Entomologist to the Indian Tea Association; and Mr. Richard Beck, Sanderhayes, Bitterne Road, Southampton, were elected Fellows of the Society.—Mr. E. C. Bedwell exhibited examples of the rare Lamellicorn beetle, *Gnorimus variabilis*, L., found by him in thick frass under the bark of oaks near Purley, Surrey.—Mr. G. C. Champion showed a specimen of *Pytho depressus*, L., with two tarsi to the right hind leg; it was bred from a larva or pupa found under pine-bark at Binn, Switzerland.—Mr. W. G. Sheldon exhibited a case to illustrate several forms of *Thais rumina*, the var. *medesicaste*, and the ab. *canteneri*, Hey., from South Spain, and from France.—Mr. W. J. Lucas brought for exhibition a set of eight examples of *Libellula quadrimaculata* from Scotland, and the South of England, to illustrate the range from the type form to the var. *prænubila* of Newman.—Mr. H. M. Edelsten also showed a varied series of the same dragonflies from the Norfolk Broads.—Mr. L. W. Newman exhibited paintings of two forms of *Dryas paphia* bred by him this season from ova of parents taken at Brockenhurst, resembling the aberration of this butterfly shown by Dr. Herbert Charles at the last meeting.—Mr. W. J. Kaye showed a synaposematic series of specimens from Ecuador, comprising Ithomiinæ and Pierinæ. Of the former there were *Discenna zavaletta*, five males and two females, and *Leucothyris zelica*, fourteen males and no females. Of the latter there were *Dismorphia othœ*, fifteen males and six females, *Dismorphia leuconia*, seven males and one female, and *Dismorphia* sp.?, four females. He pointed out that the usual coloration of *Leucothyris* species was black and transparent, but here was one, *L. zelica*, which was yellow, and the significant fact illustrated by the exhibit was that there were in the aggregate more Pierines than Ithomiines, and, taking *L. zelica* alone, there were only fourteen specimens to the thirty-three of the associated Dismorphias. It appeared therefore to be quite possible that the *L. zelica* obtained its yellow colouring by the association with the Pierines, and played the part of mimic instead of model.—Mr. H. M. Edelsten exhibited a tube containing ova of *Leucania brevilinea*, *in situ*, laid within the sheathing-leaf of a dead reed-stem found in Norfolk in July, 1908.—Mr. A. Harrison showed numerous examples of *Aplecta nebulosa*, of the form *robsoni*, bred from parents taken in Delamere Forest, the proportion in breeding being as follows: grey form, 25 %; var. *robsoni*, 51 %; and var. *thompsoni*, 24 %.—Mr. A. E. Gibbs brought for exhibition a case containing a series of *Everes argiades*, taken this year at various altitudes in the Vosges region, showing a fine large form; *Lycæna bellargus*, a female, from South

Devon, with the wings on the left side, especially the secondary, splashed and streaked with male coloration; *L. icarus*, male, also taken in South Devon, measuring only 19 mm. in expanse; and an example of *Chrysophanus phlæas*, approaching on the right side ab. *schmidtii*, from Harpenden, the ground colour of the primary being silvery-white, with the exception of a broad streak of copper colour extending from the base of the wing.—Mr. E. M. Dadd exhibited specimens of *Erebia ligea* from various German localities; a small series of *E. euryale*; examples of var. *adyte* taken at Zermatt and Pontresina; and of ab. *ocellaris* and ab. *extrema* from the Stifiser Joch. Among the Pontresina *adyte* was a single specimen which might be placed amongst the *ocellaris* without the slightest hesitation; although not quite so dark as any of these. The exhibit also included one specimen of the form *euryaloides* which is accredited to *euryale*, occurring with the *adyte* at Pontresina.—Mr. Dadd also exhibited examples of *Lycæna corydon*: a typical form from England, and the Thuringer Wald; var. *apennina* from the Sabine Mountains; the form from the South of France; and a form from Berlin, for which he suggested the name *borussia*, as being distinct from all other forms—first, in the male, by its greater size; secondly, in the extreme width of the black border of the fore wings. He also exhibited a pair of *Scodion fagaria* var. *favillacearia*, and a typical male for comparison, this being the only form of the species occurring on the heather around Berlin; and four examples of butterflies which he suggested as hybrids, viz.: *L. corydon* × *bellargus*, from Airola; *Cænonympha satyrion* × *pamphilus*, from Wengen; *Colias hyale* × *palæno*, from Oberstdorf; and *Pieris napi* × *rapæ*, from Berlin, apparently exactly intermediate between the two species.—Professor E. B. Poulton showed a family of eight butterflies bred by Mr. G. F. Leigh, F.E.S., from ova of *Charaxes neanthes*. Seven of the offspring were *C. neanthes*, and one *C. zoolina*; thus proving, so far as such numbers constitute sufficient evidence, what has long been suspected, viz., that these superficially dissimilar butterflies are forms of the same species.—Dr. F. A. Dixey, M.A., M.D., read a paper, illustrated by lantern-slides, “On Müllerian Mimicry, and Diaposematism. A Reply to Mr. G. A. K. Marshall.”

November 4th, 1908.—Mr. C. O. Waterhouse, President, in the chair.—Mr. N. P. Fenwick, Junior, of the Gables, Esher; Mr. John Spedan Lewis, of Spedan Tower, Hampstead, and 278–288, Oxford Street, W.; Mr. W. K. Lister, of Street End House, Ash, near Dover; Mr. Ivan E. Middleton, of 14, High Street, Serampore, Bengal; Mr. F. E. West, of Peradeniya, Ceylon; and Mr. J. Swierstray, First Assistant of the Transvaal Museum, Pretoria, were elected Fellows of the Society.—Mr. W. G. Sheldon exhibited examples of *Melitæa aurinia* var. *iberica*, from Barcelona, taken last May, and examples from various British and continental localities for comparison. Taking into consideration their different appearance and habits, he suggested that eventually this Catalan form of *aurinia* might prove to be distinct, or at all events a subspecies.—Mr. H. W. Andrews showed a short series of *Gymnosoma rotundatum*, L., and a specimen of *Ocyptera brassicaria*, F., two uncommon Tachinids from Glengarriff, co. Cork.—Mr. P. J.

Barraud exhibited a series of *Erebia stygne* from the French Vosges, taken in June and July this year, at 4000 ft., showing a generally brighter facies and markings than Swiss forms, and a large brightly coloured series of *Erebia ligea* from the same region, taken at 2000–2400 ft. in July. — Mr. H. M. Edelsten exhibited, on behalf of Mr. E. P. Sharpe, and Mr. A. J. Wightman, a series of *Nonagria edelsteni*, Tutt, from Sussex, taken by him in August this year, this being the first time that the species, which is quite distinct from *N. dissoluta* and the variety *arundineta*, had been observed. He also showed, for comparison, long series of *dissoluta* and var. *arundineta* from various British localities, with *N. neurica* from Germany. In pointing out the series of errors as to the identity of these *Nonagrias*, Mr. Tutt said it was necessary to rename the species that Schmidt had erroneously referred to *neurica*, Hb., and in doing so he had called it *edelsteni* (Ent. Rec., xx. pp. 164 *et seq.*), in honour of Mr. H. M. Edelsten, who had done so much towards making the differences of Schmidt's two species known to us. — Mr. H. St. J. Donisthorpe brought for exhibition *Pseudogynes* captured alive at Nethy Bridge in September last, where they occurred in some numbers in two nests of *Formica rufa*, thus indicating that *Atemeles pubicollis*, Bris., a beetle new to Britain, is to be found in Scotland. He also exhibited (a) examples of *Harpalus cupreus*, Dej., from Sandown, I.W., October, 1908; and one specimen with red legs discovered by Mr. J. Taylor at Atherstone, I.W.; (b) *Cafius cicatricosus*, Er., from Southsea; and (c) *Cryptocephalus bipunctatus*, L., taken in July by him at Niton, I.W., in July; this form being new to Britain until discovered by Mr. R. S. Mitford at Niton last year. — Mr. R. Shelford showed a "stick" insect—apparently a new species of the genus *Melaxinus*—bred parthenogenetically by Mr. H. Main. — Mr. L. W. Newman exhibited a case containing a long series of hybrids, *ocellatus* × *populi*. — Mr. H. J. Turner exhibited a long series of imagines of *Coleophora virgaureæ*; flowers of golden-rod among the pappus hairs of which were ova (infertile); photomicrographs by Mr. F. Noad Clark of the ova *in situ*; and larval cases *in situ* among the florets, to illustrate the life-history of the species. He also showed "nests" of the gregarious hibernating larvæ of *Porthesia chrysorrhæa* from Wakering Marshes, Essex, and stated that on several parts of the coast this species had now become very abundant again, plenty of nests being everywhere apparent; and dead flower-stems of *Statice limonium*, collected on Nov. 1st, containing the full-fed hibernating larvæ of *Coleophora limoniella*. — Mr. W. J. Lucas exhibited an example of *Labidura riparia*, Pall. (shore earwig), a large male taken near Bournemouth, Aug. 10th, 1908, and kept alive since that date; and two cells of the solitary wasp, *Eumenes coarctata*, found in New Forest on Oct. 31st, 1908, having never found two together previously. — Dr. T. A. Chapman exhibited a case containing specimens of the genera *Celastrina* (*Cyaniris*) and *Everes* to demonstrate the racial identity of *C. sikkima* and *C. argiolus*, *C. jynteana* and *C. limbatus*, *E. diparoides* and *E. argiades*. All these species occur together, and appear to form a mimetic group, but it would be impossible at present to determine which is the model, and what may be the object of the

mimicry. — Professor E. B. Poulton, F.R.S., exhibited the male and female imago, the preserved larva, and the cocoon of an interesting new *Lasiocampid* discovered by Mr. E. L. Clark near Durban; a set of butterflies captured on a patch of zinnias on February 21st, 1906, at Jinga, on the north of the Victoria Nyanza, by Mr. C. A. Wiggins, showing seventeen specimens of *Danaïs chrysippus*, L., of the type, and *alcippus* forms together with the intermediate examples, but no single specimen of *dorippus* (*klugii*), although of three females of *Hypolimnas misippus*, L., two were of the *inaria*, Cr., form mimicking *dorippus*. — Professor Poulton also read a letter from Mr. S. A. Neave, describing the habits of a mimetic species of *Euphaedra*. — Dr. F. A. Dixey exhibited specimens of *Heliconius amphitrite*, Riff., and *H. charithonia*, Linn.; also a coloured drawing of *H. hermathena*, Hew. He remarked that each of the first two species showed a distinct and well-marked aposeme or warning character; each of them, and especially the first, belonging to an extensive mimetic assemblage. In the third species these two distinct aposemes were combined. The specimens showed how a conspicuous and distasteful form might acquire a new aposeme without relinquishing its old one, such an intermediate form presumably sharing in the protection afforded by the aposematic forms on each side of it, while the separate aposemes which it exhibited were not mutually protective. — Dr. G. G. Hodgson exhibited a series of *Polyommatus bellargus* from Surrey localities, including a partially gynandromorphous female, two-thirds of the hind wings with the typical male coloration and markings; a series of var. *ceronus* taken in 1907, and specimens showing a variant under side recurrent in the same locality. He also exhibited a series of *Zygæna trifolii* and *Z. hippocrepidis* from one locality, including twelve melanic examples of the former, with other common forms and aberrations, probably of the latter, the sixth spot being obsolete, or represented by a mere dot. — Mr. J. C. Kershaw communicated a paper on "The Life History of *Erianthus versicolor*," Brunner, an orthopteron of the family Mastacidæ. — H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — October 22nd, 1908. — Mr. Alfred Sich, F.E.S., President, in the chair. — Mr. McArthur exhibited a long series of *Argynnis aglaia* and fine specimens of *Asteroscopus nubeculosa*, from Aviemore. — Mr. Tonge, bred specimens of *Pieris brassicæ* with partial black margin to hind wings, *Cerura bifida* bred from a Reigate female, a very varied series of *Agrotis cursoria* from Lowestoft, and a long series of *Hydræcia nictitans* from the same place. — Messrs. Harrison and Main, a bred series of *Nemeobius lucina* from ova, Horsley; and two larvæ of *Limenitis sibylla* in their curious hybernacula, on sallow, from the New Forest. — Mr. Hodgson, a large number of *Pieris rapæ*, illustrative of the experiments he was making on the species. — Mr. R. Adkin, series of *Rhodophea suavella* and *R. marmorea*, with branches of blackthorn showing their larval webs, from Eastbourne, and read notes on the species; a specimen of *Peronea permutana* bred from a larva taken on *Rosa spinosissima* at Beachy Head; and unusually light and dark forms of *Tortrix heparana* from the same

locality and Lewisham. — Mr. Newman, a series of *Dicranura bicuspis* bred from Tilgate Forest, and an example of *Abraxas grossulariata* ab. *varleyata*, female, just bred as a second brood. — Mr. Main, sprays of blackthorn on which were ova of *Ruralis betulae*. — Mr. Smith, *Plodia interpunctella*, found in the Society's Library just previous to the meeting. — Mr. Rayward, a specimen of *Epinephele jurtina*, with considerable pallid areas, and male and female specimens of *E. tithonus*, with additional spots on the fore wings. — Mr. F. Noad Clark, under the microscope, the early instars of *Nola albulalis* larvæ, and the ova of *Coleophora virgaureae* in situ among the pappus hairs of golden-rod. — HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — October 6th. — Mr. J. A. Clark exhibited *Camptogramma bilineata*, Margate, July, 1908, including a specimen with broad black band on fore wings. — Mr. H. M. Edelsten, *Sterrhia sacraria*, South Devon, September, 1908. — Mr. G. H. Hoath, six *Grammesia trigrammica* var. *bilinea*, Kent, June, 1908, taken on two evenings, on two sugar patches close to one another, while the rest of a somewhat extensive "round" yielded no examples of this form. — Mr. L. W. Newman, *Lycæna corydon* var. *obsoleta*, Dover, 1908; also a long series of *Bombyx castrensis*, including unicolorous yellow males and females. — Mr. L. B. Prout, a large, dark, strongly marked ab. of *Eupithecia expallidata*, Tunbridge Wells, and a strongly black-marked ab. of *Nonagria sparganii*, East Kent; also, on behalf of Mr. J. Taylor, an extraordinary Agrotid, apparently an ab. of *Agrotis segetum* female, with dark clouding round the pale stigmata, October 3rd, 1907. — Mr. A. Sich, cocoons of *Cemiostoma laburnella*, showing strength of silk in bending materials on which the cocoons were spun; also mines in leaves of *Rumex acetosa* from Richmond, containing larvæ of *Nepticula acetosæ*. — Mr. P. H. Tautz, series of *Leucania vitellina*, August 15th to 30th, Dorsetshire coast, 1908. — Mr. A. J. Willsdon, ovum, pupæ, imagines, and ichneumon of *Alucita graphodactyla*; also its food-plant, *Gentiana prenmonanthe*.

October 20th. — Messrs. H. Leach, of Rickmansworth, and F. Pennington, of Cranleigh, were elected members of the Society. — Mr. A. Bacot exhibited pupæ of *Euchloë cardamines* attached to twigs and cards of various shades; these pupæ showed distinct gradations in depth of colour, corresponding to the lightness or darkness of the substance on which they had pupated. — Dr. T. A. Chapman, *Tanagra atrata* var. *pyrenaica*, bred from Gavarnie ova. — Mr. H. M. Edelsten, ova of *Leucania brevilinea*, laid within sheathing leaf of dead reed-stem, Norfolk, July, 1908. — Mr. W. J. Kaye, dead pupa of *Lycæna arion*, one of several found by Mr. Percy Richards under stones near Bude. — Mr. L. W. Newman, *Hepialus humuli* var. *hetlandica* from Shetlands, showing considerable variation; *Anarta melanopa*, from the same locality; and abs. of *Chrysophanus phlæas*, Bexley, October, 1908, including a specimen with greyish black under side and female with usual bands on hind wings obsolete. — Mr. P. H. Tautz, bred series of *Stauropus fagi*, from Chalfont Road ova, including dark female. — S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

British Oak Galls. By EDWARD T. CONNOLD, F.Z.S., F.E.S. Author of 'British Vegetable Galls,' &c. Illustrated with 68 full-page plates, 21 insets, and 17 small drawings. Pp. i-xviii and 1-169. London: Adlard & Son. 1908.

THE subject-matter in this very excellent book is arranged in six chapters, the first five of which are respectively headed "The Principles of Oak Gall Formation" (pp. 1-8), "Some Features of Oak Gall Growth" (pp. 9-19), "The Numerical Aspect of Oak Galls" (pp. 20-25), "The Cynipidæ Affecting the Oak" (pp. 26-32), and "The British Oak" (pp. 33-39).

Chapter vi. commences with some useful hints on collecting and mounting oak galls (pp. 40-48). The softer galls unfortunately soon lose both form and colour. In such cases the author recommends carefully coloured drawings, or photographs, showing the objects in their actual size, as affording the best permanent records of their appearance in nature. On p. 49 a table of British Cynipidæus gall-producers and, where known, their alternate generations, is given. Of six species the sexual generation only seems to have been detected, and of seven others the agamous form alone appears to be known. We observe that *Neuroterus schlechtendali*, Mayr, is cited as a synonym of *Spathegaster aprilius*, Giraud. Schlechtendal and F. Löew, however, consider *N. schlechtendali* to be the agamous form of *S. aprilius*, and we believe that evidence has been published tending to show that the former is the summer gall. Anyway, our author inclines to the opinion held by Adler that the alternate generation is most probably *Neuroterus ostreus*, Hartig. Descriptions of the fifty-four British Oak Galls and remarks thereon occupy ninety-one pages, and in the case of each gall there is a synoptical table in which a great deal of information is presented in a handy form. The illustrations are admirable, and, with one or two exceptions, are from photographs of specimens obtained around Hastings.

Galls are of interest not only to the specialist who studies the insects producing them, the inquilines and the parasites, but also to Nature students generally. Their various forms and curious manner of growth always attract attention. Pictorial aid in the identification of the oak species and trustworthy information concerning them are now at the service of all who furnish themselves with a copy of Connold's 'British Oak Galls.'

Diptera Danica. Genera and Species of Flies hitherto found in Denmark. By WILLIAM LUNDBECK. Part II. Asilidæ, Bombyliidæ, Therevidæ, Scenopinidæ. With 48 figures. Pp. 1-160. Copenhagen: G. E. C. Gad. London: Wesley & Son. 1908.

THE first part of this capital work (published at the expense of the Carlsberg Fund) was referred to in the 'Entomologist' for 1907, p. 264. There are synoptical tables of the subfamilies, genera, and species, and the sequence of the families and of the species embraced therein is very similar to that in Verrall's 'List of British Diptera,'

the second edition of which was published in 1901. Genera are discussed at some length, and the descriptions of species are ample. The dipterous fauna of Denmark appears to be closely identical with that of our islands, and, as the work under notice is printed in English, it should secure the attention of British students of this Order of the Insecta.

A Preliminary List of Hertfordshire Diptera. By A. E. GIBBS, F.L.S., F.E.S., and PHILIP BARRAUD, F.E.S.

WE are indebted to the authors for a reprint of this very useful list. It was published during the year in the 'Transactions' of the Hertfordshire Natural History Society (vol. xiii. pt. iv. pp. 249-276). Except as regards the Pulicidæ, a list of which is contributed by the Hon. N. Charles Rothschild, a very large proportion of the species mentioned were obtained by Mr. Albert Piffard, who presented his collection of Diptera to the British Museum. In the matter of identification of the species the authors acknowledge much assistance from the Rev. E. N. Bloomfield and Mr. E. E. Austen.

The Genera of the Tortricidæ and their Types. By C. H. FERNALD, A.M., Ph.D. Pp. 1-68. Amherst, Mass.: Press of Carpenter and Morehouse. 1908.

AN exceedingly interesting and highly valuable compilation, commenced some twenty years ago and added to from time to time up to present date. The author, however, does not consider it yet complete, but he publishes it in the hope that any errors or omissions may be made known to him. Even as it is it will most certainly be of very great utility to everyone interested in this intricate subject.

Proceedings of the Hawaiian Entomological Society. Vol. i. pt. 5, with plate and text figures, pp. 163-210 (April, 1908); vol. ii. pt. 1, pp. 1-35 (October, 1908).

AMONG other matters of interest in pt. 5 are the following:—Presidential Address by W. M. Giffard, in the course of which he gives an account of the island of Lanai and its entomological fauna (pp. 176-184). "A List of the Described Hemiptera (excluding Aleyrodidæ and Coccidæ) of the Hawaiian Islands," by G. W. Kirkaldy (pp. 185-208, plate 4).

Broteria: Revista de Sciencias Naturaes do Collegio de S. Fiel. Vol. vii. Serie Zoologica. Leipzig. THEODOR OSWALD WEIGEL. 1908.

CONTENTS:—"Neurópteros de Espana y Portugal," por Longinos Navás (pp. 1-131). "Description d'un Aphidien nouveau de Portugal," par le Dr. G. Horváth (p. 132). "Contributio prima ad cognitionem Cecidologiæ Regionis Zambeziæ (Moçambique, Africa Orientalis)," auctore Prof. J. S. Tavares. Plates ii.-xvi.

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EDITORIAL.

WE have very great pleasure in adding the name of Mr. CLAUDE MORLEY to the list of specialists who are good enough to advise and assist us in their particular departments of Entomology. Mr. Morley, who is the author of 'The Ichneumons of Great Britain,' and of other works on Hymenoptera, has already contributed various instructive and helpful papers to our pages, and it is hoped that his closer connection with the magazine may be followed by the appearance of many other articles from his pen.

ZENILLIA (MYXEXORISTA) ROSEANÆ, B. & B., A NEW BRITISH DIPTERON.

By JAMES E. COLLIN, F.E.S.

IN November last I received from Mr. R. Adkin several specimens of the dipteran to which he refers in the subjoined note as having been reared from pupæ of *Tortrix pronubana*, Hb. They were submitted to Mr. C. J. Wainwright, who has made a special study of the Tachinid group to which they clearly belonged, and he is of opinion that they are undoubtedly referable to *Zenillia roseanæ*, B. & B., a species not hitherto recognised as British and which may be known by the following characters:—

A small to moderate sized species of the usual Tachinid appearance, black with greyish reflections. Face and orbits whitish. Eyes sparsely hairy. Frons only slightly produced, at the vertex about one quarter the width of the head (female), slightly less in the male; two pairs of orbital bristles in the female, none in the male; frontal bristles in a single row extending scarcely beyond the level of the insertion of the arista, outside this row for its entire length there are a number of fine hairs, scattered in the male, but less numerous and almost in a single row in the female. Ocellar bristles developed, pointing forwards. Mouth margin not produced, one strong pair of vibrissæ placed just above the mouth opening, the smaller oral bristles continued in a row

quite halfway up the face. Cheeks bare, jowls narrow, about one sixth the height of eye. Palpi stout and black. Antennæ very long, third joint quite four times the length of second, arista bare, distinctly thickened to about the middle, second joint not much lengthened. Scutellum blackish grey, terminal bristles crossed and not erect, though slightly upturned. Abdomen ovate, with discal and marginal macrochetæ. Hind tibiæ with unequal bristles, unguis microscopically pubescent, nearly as long as last tarsal joint (male), much shorter (female). Wings with first posterior cell open, ending just before wing tip, angle of cubital vein slightly rounded and without an appendix, radial vein bristly at base only. Length 4-6 mm.

Zenillia (Myxexorista) roseanæ was described by Brauer & Bergenstamm in Denkschr. Akad. Wien lviii. (1891) p. 332. It was known to them in the female sex only, the specimens having been bred from *Tortrix roseana*, Hw., and no one appears to have recognised the species since.

Mr. Adkin has also reared another parasitic dipteran from *Tortrix pronubana* which appeared with the above; this second species is *Nemorilla maculosa*, Mg., which is reported as having been bred on the Continent from *Acrobasis consociella*, Hb., *Cacæcia murinana*, Hb., *Psecadia bipunctella*, F., *Rhodophaea suavella*, Zk., *Sylepta ruralis*, Scop., and *Pyralis* sp.

Newmarket: December, 1908.

The first traces of the parasite referred to above were seen in June last, when, in the cage in which I was keeping the pupæ of *Tortrix pronubana*, I found several dipterons not unlike small houseflies in general appearance. Upon closer investigation I found among the leaves in which the *Tortrix* had pupated the puparia from which the dipterons had emerged. In the autumn I again collected wild larvæ of *T. pronubana*, which in due course pupated, and the dipterons again began to appear. I therefore made a careful examination of the pupal webs, and in many cases found a dipterous puparium in the web alongside the lepidopterous pupa; in every case the pupa had been fully formed before the parasitic larva emerged from it. The number of pupæ infested I should estimate at fully twenty per cent. *Tortrix roseana*, the species from which Bergenstamm reared the original specimens of *Zenillia roseanæ*, occurs in the same gardens where *T. pronubana* is found, and is also pretty generally distributed throughout the surrounding country; it is therefore quite likely that the dipteran may all along have infested that species, but been overlooked, and that having found a more suitable host in the double-brooded *T. pronubana*, has been able to multiply more rapidly, and even become a serious menace to its existence; yet it should be noted that larvæ of *Tortrix podana* and *Batodes angustiorana*, taken in some numbers at the same time and place as the spring larvæ of *T. pronubana*, showed no signs of the parasite.—ROBERT ADKIN.

THE GENERIC NAME *ACIDALIA*.

By LOUIS B. PROUT, F.E.S.

Now that we have the excellent "International Code" of nomenclature to guide us, together with the supplementary report which appeared in the American 'Science' for Oct. 15th, 1907 (pp. 520-523), there is some hope of definite progress towards a correct application of generic names, and I trust we can give a decent burial alike to the Scudderian phantom of "restriction" of one name *by another*, and the fetich of "page-priority." In my own work under this code I have found exceedingly few cases of perplexity, and most of those long academic discussions which have delighted some of us will no more be necessary. Of Treitschke's genera, mostly founded in 1825 on "bibliographic references" to Schiffermüller, and therefore prior to those of Hübner's 'Verzeichniss' (apparently not published till 1826), nearly all had types selected for them by Duponchel in 1829, and only three or four of his selections were really unhappy on diagnostic grounds. At the moment I am only concerned with *Acidalia*.

Assuming that the date 1826 will be definitely accepted for Hübner's 'Verzeichniss,' the name *Acidalia* really belongs to the Geometridæ. In my "Notes on the Wave Moths" (Entom. xxxviii. 6) I pointed out that the only logical type for *Acidalia* according to the diagnosis was *brumata*, Linn.; and I strongly adhere to that as my own personal opinion. But Duponchel in 1829 selected *strigaria*, Hb.; Curtis in 1831 *aversata*; and Stephens in 1835 (Ill. Haust. iv. 393) *ochrata*. By the strict rule Duponchel's selection must stand unless (1) the genus already possessed a type "on the basis of the original publication"; or (2) *strigaria* was "not included under the generic name at the time of its original publication," or was a *species inquirenda* from Treitschke's standpoint, or was doubtfully referred by him to *Acidalia* (vide 'Science,' 1907, p. 521). The first was certainly not the case; of the contingencies under (2), only the question of the *species inquirenda* could apply, for Treitschke did include *strigaria* in 1825, and not with a query. I believe, however, that he was fairly well acquainted with the species.

If, then, Duponchel's action can be set aside, it can only be on the ground of the nature of the "indication" of the genus. *Acidalia*, Tr., was, at its original publication in 1825, mainly a name for an unnamed genus of Schiffermüller's (1775), and Schiffermüller did not include *strigaria* therein (if, as I believe, *strigaria*, Hb., Tr. = *virgulata*, Schiff., the last-named placed it in a different genus).

But it is, I suppose, better that a few generic names should

be illogically applied than that complicating exceptions should be allowed into a simple system; and in any case *ochrata*, Scop. (Stephens' choice—Curtis' is *ultra vires*, for *aversata* was placed in *Idæa*, Tr.), which would have to be accepted under the Code, would no better fulfil the evident original intention of Schiffermüller and Treitschke than does *strigaria*. Therefore, I accept *strigaria*, Hüb., as the type of *Acidalia*, Tr., Dup. restr. Perhaps it is a just retribution on Treitschke for creating such a "mixed genus," and it saves the name of *Operophtera*, Hüb., for *brumata*.

I showed in 'The Entomologist' for 1906 (xxxix. 266) that on every conceivable ground then known to me *ornata*, Scop., was the type of Schrank's genus *Scopula*; and as I believe no one had ever previously "selected a type" from Schrank's two species, I claim that this action can stand, in spite of the indifference of the Code to generic diagnosis. The genus, if we give it Hampson's scope, will be *Scopula* = *Acidalia* = *Arrhostia* = *Leptomeris* = *Craspedia* = *Emmiltis* = *Dosithea*; but as it is possible to make a separate genus, on wing form, for the *ornata* group, I would suggest that believers in small genera subdivide thus:—

A. *Scopula*, Schrank = *Craspedia*, Hb. = *Dosithea*, Dup. (type, *ornata*, Scop.). Hind wing with margin more or less scalloped, especially between vein 4 and 6.

B. *Acidalia*, Tr. = *Arrhostia* (Hb.), H.-S. = *Leptomeris* (Hb.), Meyr. = *Emmiltis* (Hb.) Warr., (type, *virgulata*, Schiff. = *strigaria*, Hb.). Hind wing with margin not scalloped.

Sterrrha, Hb., and *Ptychopoda*, Stph., abide unmoved amidst all these changes.

December 9th, 1908.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from vol. xli. p. 307.)

BEFORE entering upon the general question of variation, and especially upon the original descriptions of the named varieties, there is one of the latter which seems to me to merit special attention on the ground that it is almost certainly a distinct species, viz. the Bukowina form generally known as *aurelia* var. *dictynnoïdes*, Horm. This form is described very completely and at great length in 'Iris,' x., pp. 2 *et seq.* (1898). Finding that no specimen at my disposal really corresponded with this description, particularly in the matter of the remarkably elongated wings, on which great stress is laid in the description, I wrote to Herr von Hormuzaki, who courteously replied, sending me a pair taken on Mt. Cecina, near Czernowitz, the same locality from which the

originally described specimens came. These are of course absolutely authentic, and I exhibited them the day after their arrival (*i.e.* Nov. 18th) at the meeting of the Ent. Soc. of London, and also on the 26th at the South London Meeting. They may be most readily described as the converse of *britomartis*, having the *upper side* of *dictynna*, but the *under side*, as Hormuzaki says, generally nearest to *parthenie*, but often to *athalia* and sometimes even to *deione*, "but never," as he remarks, "like *aurelia*," and, one may add, still less like *dictynna*. Hormuzaki's account is too long for transcription, and also unfortunately treats the dark part as the ground-colour (excusably enough in the Bukowina *Melitæas* of this group), so that the simplest plan would seem to be to describe it from his specimens in terms of the general description of the group (vol. xli., pp. 200, 201, 221), noting those respects in which he mentions this form as being variable.

Up. s. f. w. : Lunules replaced by small quadrangular or irregularly triangular spots in the male, occasionally regularly triangular in the female, the lowest always absent and the third always somewhat the largest. Subterminal and elbowed lines thick, leaving small, more or less quadrangular spots of the ground colour; inner subterminal almost as much bent as in *athalia*; marginal blotch very large but sometimes containing a patch of the ground colour, especially in the female. Stigma oval, containing traces of the ground colour, or only thickly outlined; basal lines thick, or, in the male, included in the basal suffusion which almost reaches the marginal blotch.

Up. s. h. w. : Outer line coalescing with border, so as to form a broad marginal band, rarely showing traces of a row of spots of the ground colour in the male, oftener in the female, where they are sometimes fairly distinct, round, triangular, or even lunular, whitish in some females and in one male, especially near the costa; inner line included in the large basal suffusion, which in some males extends over the whole wing, as in *dictynna* ab. *seminigra* (Musch.), though occasionally it only reaches to the extra line, giving another line of spots of the ground colour, or sometimes of a lighter shade, some of which are in rare cases lengthened out towards the base.

Un. s. f. w. : Inner line of border bearing (in both my specimens) small dark triangles as in *deione*; lunules light, especially towards the costa, and two or three light spots between the subterminal lines, the outer of which is distinct, the inner traceable, throughout; elbowed line represented by a row of spots, most conspicuous, as is the inner subterminal, near the costa; marginal blotch very small, the other dark markings clear but fine.

Un. s. h. w. : Inner edge of border slightly angulated, both parts of terminal band nearly (or quite) unicolorous, which is also the case in my specimens with the central band; outer band interrupted near costa, the lunules almost reaching the central band, and being utterly destitute of the black points of *dictynna* and *britomartis*; central band very broad, the third and fourth spots not projecting far beyond the others; inner band rather narrow, with small light spot, basal band also narrow, with very small central spot and the fifth spot absent.

Antennæ as in *athalia*, but with even less white edging at the joints above; beneath, the white sometimes runs into the side of the tip.

As the palpi appear to vary it will be best to give Hormuzaki's own description. He says that they are black from above, with occasionally a few red-brown hairs, never with whitish or greyish-yellow hairs, though he has two specimens whose palpi, seen from above, are reddish. The outer side is occasionally red-brown throughout, the terminal joint being generally of this colour, or reddish-yellow, but occasionally black, the middle and lower joints are, however, generally black towards the base, rarely sprinkled with yellow, but the yellow becomes much more noticeable on the middle joint, and towards the terminal joint merges into red-brown. The hair forms a reddish-yellow or black brush towards the end of the middle joint. The inner side of the lower and middle joints is bright yellow but towards the terminal joint generally reddish, though sometimes blackish or red-brown.

Much stress is laid by Hormuzaki on the elongated shape of the wings and a number of measurements given to show how constant is this peculiarity in comparison with *athalia*; this is certainly very noticeable in the case of a pair of *Bukowina athalia* kindly sent to me by him with the *dictynnoïdes*, but I possess *athalia* from the Rhone Valley and the lower Vaudois Alps with wings quite as elongated, especially in the female. The *Bukowina* examples have a remarkably square and "cobby" appearance, even more so than the mountain specimens from Switzerland. I think that if I were exclusively a "study-lepidopterist" without any "field" experience (such people really do still exist, and even propound theories in more than one European language), I should be inclined on the mere face of things to regard *dictynnoïdes* as a very dark form of *athalia*, but the field knowledge which Hormuzaki brings to bear on the subject puts this theory out of the question; for he tells us that these are the only two *Meliteas* of this group that are common in *Bukowina* and the neighbouring districts; that *dictynnoïdes*, the commoner of the two, is found in some places where *athalia* is not; that in others *athalia* only is found; but that in many places both occur together. Moreover, *dictynnoïdes* flies from the beginning of June, or sometimes the end of May, and never later than mid-July, whereas *athalia* appears about June 30th and continues till near the end of July. With *aurelia*, with which it is generally placed, it has nothing whatever in common, and even if it had, the case of those who hold this theory would be put out of court by the fact that typical *aurelia*, differing very little from the Valais form, is also taken at Czernowitz, where it comes out from three weeks to a month later than *dictynnoïdes*; it is, however, scarce, and this is its only known locality in *Bukowina*. The upper side is certainly near *dictynna*, but the under side separates it entirely from that species;

it is still further from *varia*, further still (in spite of some resemblance on the under side) from *deione* and *parthenie*, is the very converse of *britomartis*, and has not even a superficial resemblance to any form of *asteria*. The earlier stages, when they become known—which there is reason to hope may be during next season—may give cause for the reconsideration of any opinion now expressed, but so far as our present knowledge extends, I feel no doubt that we should regard it as a distinct species. The question of its phylogeny is most interestingly discussed in the same paper, and to this reference will have to be made again.

THE DRAGONFLIES OF EPPING FOREST IN 1908.

By F. W. & H. CAMPION.

THE season began with a backward spring, but at least the usual number of dragonflies appeared with the beautiful weather which came in June. By the end of August dragonflies had become decidedly scarce, although a few of the common kinds survived to enjoy the warm summer-like days of early October.

Unusually late dates were recorded for *Libellula depressa* and *Æschna grandis*.

Erythromma najas was added to the list of Odonata collected by ourselves in Epping Forest. That list now consists of twenty-one species, or exactly one half the total for the British Islands.

An account of the captures made during the year is given below, the species being named in the order in which they came under our observation.

(1) *Pyrrhosoma nymphula* was, as is usual in our district, the dragonfly earliest on the wing, and a single immature female was obtained on May 10th. On May 31st a male was discovered to have the right hind wing in a very rudimentary state. It is a remarkable fact that we have in our collection quite a number of dragonflies, belonging to various species, having the same wing in a more or less undeveloped condition. *P. nymphula* was not noticed after July 12th.

(2) *Cordulia aenea* occurred very early in the season, a somewhat immature male being taken on May 17th. A week later (May 24th) we obtained two newly-emerged females, from which we learned that at that stage of development the abdomen is emphatically purple, although the front of the thorax is already green. The eyes were opaque brown, and the band between segments two and three, instead of being yellow, was dirty white. The wings were brownish, and the basal saffron was pale and indistinct. The accessory membranes were satin-white, and the pterostigmata grey. On June 7th two more females were taken, both fine adult specimens. One of them had the wings very

dark and the saffron strongly marked. On this occasion we were able to confirm what we had observed in a previous year, that the eyes of the female are wholly green, little if at all inferior, in richness of colour, to the splendid eyes of the male. De Selys is quoted in Mr. Lucas's book as stating that in the female there is a "chestnut tint to upper surface of eyes," but, so far as the adult insect is concerned, this statement is not in accord with the observations here recorded. A female was observed to be ovipositing on June 21st. By July 12th, when the last specimen was obtained, the species had become very scarce, and it was noticed that the eyes of the male then taken were losing the translucent green observed so recently as a week before, and were acquiring a tinge of chestnut.

(3) *Agrion puella*.—The first specimens were taken on May 31st and the last on August 16th. On June 28th a male was obtained while feeding upon a small moth, which had already lost its head and its left hind wing. The prey was identified as *Tortrix viridana*, and the identification was kindly confirmed by Mr. R. South. The form of the female having cuneiform blue spots on segments three to six occurred on June 21st and July 5th and 12th.

(4) *Ischnura elegans*, first taken on May 31st, continued to be met with until August 30th. The form of the female known as *rufescens* was taken on July 12th and 26th, and the form named *infuscans* on June 14th and 21st, July 5th and 25th, and August 30th.

(5) *Enallagma cyathigerum* was found in flight from May 31st to Sept. 12th. On June 8th a male was taken with the anterior portion of the spot on segment two entirely disconnected from the circlet behind; the spot closely resembled the exceptional marking numbered 1 on plate xxvii. of 'British Dragonflies.' A female of the type (blue) form was collected on July 12th.

(6) *Libellula depressa* was first seen on the wing on May 31st, but no specimens were taken before June 28th. The latest capture was that of a single male on September 7th, an extremely late date for the species. Notwithstanding the fact that this year's specimens (four males) were obtained from widely separated parts of the Forest, they all differ in a marked degree from those taken in other seasons in having the abdomen narrow and strongly triquetrous, instead of broad and flattened.

(7) *Erythromma naid* was met with by us for the first time in Epping Forest on June 14th, when it was in fine condition and fairly well distributed along the margins of one of the Forest ponds. It was seen again on several occasions, at that and other ponds, but specimens were then difficult to get, owing to their usually flying well away from the banks, and resting upon the floating leaves of *Potamogeton*. In such circumstances they were very liable to be mistaken for *I. elegans* or overlooked

altogether, and herein may lie the explanation of their having escaped our notice in previous years, although in 1900 Mr. F. Enock bred the species from nymphs taken at Loughton (Entom. 1901, p. 68). No captures were made after June 28th, but the species probably lasted for some time longer.

(8) *L. quadrimaculata* was not uncommon in the central parts of the Forest, where captures were made on June 28th.

(9) *Anax imperator* was first met with on June 28th, when two males were taken, one of them with wings in poor condition. We think it incorrect to describe the eyes of this species as blue, and that a truer description would be:—Eyes opaque green, lightly shot with translucent blue on their upper surface. On the same occasion a male, not taken, was observed to dash through a swarm of *Tortrix viridana*, which were flying about an oak-tree, and was seen to seize and fly off with one of the moths. A specimen was noticed as late as August 2nd.

(10) *Æschna cyanea*, usually such a common insect, was decidedly scarce. A newly-emerged male was taken, with its discarded nymph-skin, on July 5th, and provided us with a date for the species earlier by sixteen days than our previous earliest date. No specimen with the mature coloration was obtained before August 16th (a male), but we continued to meet with the insect until October 18th, when another male was taken.

(11) *Æ. grandis* was first seen in flight on July 25th, and a very immature female was taken on August 2nd, although the species, in fully adult condition, was already common. On Aug. 9th, by which time this insect had become extraordinarily abundant everywhere in the Forest, a female taken while ovipositing had segment six and the following segments of the abdomen wet from immersion in the water. Another female, similarly engaged, was netted on September 6th, and had more than half the segments (Nos. 5–10) in a wet state. On September 27th we watched for a considerable time a specimen of *Æ. grandis* hawking over a pond, and saw it take several insects in succession, some of which it deliberately discarded after examination: this observation was interesting as showing that all is not prey that comes to a dragonfly's jaws. A female was obtained as late as October 11th, and the species was again seen even a week after that.

(12) *Sympetrum striolatum*.—Immature females made their appearance on July 25th, but no males could be found before August 9th. The species was never really common, and the last capture was effected on October 18th.

(13) *S. sanguineum*.—The only examples secured were a freshly-emerged female (July 26th) and an adult male (Sept. 12th). The first was obviously a native of the pond at which it occurred. In the matter of coloration, the chief points which distinguished this specimen from adult females appeared to be these:—Saffron at base of wings inconspicuous; pterostigmata greenish grey;

dorsal aspect of thorax and abdomen brownish yellow; abdomen without white powder on ventral surface.

(14) *Lestes sponsa* was plentiful in one locality on August 10th; a few of the males were immature, and deficient in blue powder on those parts which take on a pruinose condition in later life. The species was again met with, at another locality, on August 16th.

Among dragonflies seen but not taken may be mentioned a single *Calopteryx* (June 14th), and an *Æschnid* with which we got to very close quarters on September 10th; judged by its size and manner of flight, it must have been *Æ. mixta*.

33, Maude Terrace, Walthamstow:
Dec. 1st, 1908.

LIST OF PAPERS OF THE LATE MARTIN JACOBY.

BY GEORGE JACOBSON.

ALL the numerous entomological publications (one hundred and forty-one in number) of the late Martin Jacoby (who died Dec. 24th, 1907) are devoted to one family of beetles only, to the Chrysomelidæ or Phytophagous beetles. The author has described 238 genera, 5094 species, and 7 varieties in this family. According to this enormous number of described species, which embraces one-fourth of all the known species of the family, we must range M. Jacoby in the first place among workers in the field of descriptive morphology of Chrysomelidæ.*

Jacoby's influence as authority within the narrow limits of this family is particularly great, because he concentrated his attention on the study of the Chrysomelidæ exclusively, and never went beyond it. Even in the family he seems to have ignored two large subfamilies: Cassidini and Hispini. Moreover, of Palaearctic forms he described only one species from the Island of Crete, and a few species from Japan and North China. The great majority of his papers are purely descriptive, except Nos. 68, 88, 90, 123, 124, and 127 (concerning external morphology of separate groups and genera), Nos. 11 and 140 (representing two faunistic revisions with some descriptive material), and Nos. 106, 116, 117, 130, 131, and 136 (of general systematic interest).

1. Description of New Genera and Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1876, pp. 807-817. [1 new genus, 21 new species, 1 new variety.]

* We possess no data concerning the numbers of species described within limits of this family by other specialists, but there is no doubt that no other coleopterist (even Baly in England) has described so many forms as the late Martin Jacoby.

2. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1877, pp. 510-520. [18 new species.]
3. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1878, pp. 144-153. [21 new species.]
4. Description of New Species of Phytophagous Coleoptera from Central and South America. Proc. Zool. Soc. London, 1878, pp. 982-996. [29 new species.]
5. Verzeichniss der von Herrn Ed. Steinheil in Neu-Granada gesammelten Cryptocephalini und Criocerini. Mitth. München. Ent. Ver. ii. 1878, pp. 134-162. [25 new species.]
6. Descriptions of New Species of Coleoptera of the Family Halticidæ. Proc. Zool. Soc. London, 1879, pp. 439-446. [16 new species.]
7. On Phytophagous Coleoptera collected by Mr. Thamm at Chanchamayo, Peru. Cist. Ent. ii. 1879, pp. 513-527. [26 new species.]
8. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1879, pp. 773-793. [38 new species.]
9. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1880, pp. 166-182, pl. xviii. [32 new species.]
10. On a Collection of Phytophagous Coleoptera made by Mr. Buckley at Eastern Ecuador. Proc. Zool. Soc. London, 1880, pp. 588-609, pls. liv.-lv. [36 new species.]
11. Biologia Centrali-Americana, edited by D. Godman and O. Salvin. Insecta; Coleoptera. Vol. vi. Part 1. Phytophaga (part). London, 1880-92. 4to, xx.-625 pp. 43 pls. [26 new genera, 826 new species, 2 new varieties.]
— Supplement 1888-92, 374 pp. [16 new genera, 350 new species.]
12. Descriptions of New Genera and Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1881, pp. 439-450. [2 new genera, 20 new species.]
13. Descriptions of New Genera and Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1882, pp. 50-58. [3 new genera, 15 new species.]
14. Descriptions of some New Species of Beetles of the Family Galericidæ. Proc. Zool. Soc. London, 1883, pp. 399-406, pl. xlv. [12 new species.]
15. Zur Kenntniss der Gattung *Microlema*, Baly. Stettin. Ent. Zeitg. xlv. 1883, pp. 125-127.
16. Beschreibungen neuer Phytophagen. Stettin. Ent. Zeit. xlv. 1884, pp. 126-128. [3 new species.]
17. Two New Species of Malayan Phytophagous Coleoptera. Notes Leyden Mus. vi. 1884, pp. 7-8. [2 new species.]
18. Descriptions of New Genera and Species of Phytophagous Coleoptera from Sumatra. Notes Leyden Mus. vi. 1884, pp. 9-70. [8 new genera, 55 new species.]
19. A New Species of the Phytophagous Genus *Haplosomyx*. Notes Leyden Mus. vi. 1884, p. 71. [1 new species.]
20. On *Haplosomyx sexplagiatus*, Baly. Notes Leyden Mus. vi. 1884, p. 72.

21. Descriptions of New Genera and Species of Phytophagous Coleoptera Collected by Dr. B. Hagen at Serdang (East Sumatra). Notes Leyden Mus. vi. 1884, pp. 201-230. [5 new genera, 26 new species.]

22. Description of two New Species of the Phytophagous Genus *Pachytoma*. Notes Leyden Mus. vi. 1884, pp. 231-232. [2 new species.]

23. Description of a New Genus and three New Species of Malayan Galerucinæ. Notes Leyden Mus. vi. 1884, pp. 234-235. [1 new genus, 3 new species.]

24. Descriptions of New Genera and Species of Phytophagous Coleoptera from the Indo-Malayan and Austro-Malayan subregions, contained in the Genoa Civic Museum, I.-III. Ann. Mus. Civ. Genova, xx. 1884, pp. 183-233; (2) ii. 1885, pp. 20-57, (2) iv. 1886, pp. 41-121. [16 new genera, 212 new species, 1 new variety.]

25. Descriptions of the Phytophagous Coleoptera of Japan, obtained by Mr. George Lewis during his Second Journey, from February, 1880 to September, 1881, I.-II. Proc. Zool. Soc. London, 1885, pp. 190-211, 719-755, pl. xi. xvi. [1 new genus, 82 new species, 1 new variety.]

26. Beschreibung einer neuer *Ædionychis*-Art von der Insel Creta. Stettin. Ent. Zeitg. xlvii. 1885, pp. 215-216. [1 new species.]

27. Descriptions of some New Species and a New Genus of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1885 (1886), pp. 925-929. [1 new genus, 8 new species.]

28. Descriptions of some Undescribed Species of Phytophagous Coleoptera from Abyssinia contained in the Genoa Civic Museum. Ann. Museo Civ. Genova (2) iv. 1886, pp. 129-128. [8 new species.]

29. [and Bates, H. W.] List of a small Collection of Coleoptera obtained by Mr. W. L. Selater in British Guiana. Proc. Zool. Soc. London, 1887, p. 490, fig.

30. Description of two New Species of *Æsernia*. Notes Leyden Mus. ix. 1887, pp. 300-302. [2 new species.]

31. Descriptions of some New Genera and Species of Phytophagous Coleoptera contained in the Leyden Museum. Notes, Leyden Mus. ix. 1887, pp. 229-243. [2 new genera, 14 new species.]

32. Descriptions of the Phytophagous Coleoptera of Ceylon, obtained by Mr. George Lewis during the years 1881-82. Proc. Zool. Soc. London, 1887, pp. 65-119, pls. x.-xi. [16 new genera, 90 new species.]

33. Notes on Some North American Species of Halticinæ (Group Monoplati). Trans. Amer. Ent. Soc. xv. 1888, pp. 302-303.

34. Some New Species of Phytophagous Coleoptera from Brazil (Colony Blumenau). Notes, Leyden Mus. x. 1888, pp. 153-160. [6 new species.]

35. Descriptions of New Species of Phytophagous Coleoptera from Kiukiang (China). Proc. Zool. Soc. London, 1888, pp. 339-351. [18 new species.]

36. Descriptions of New or Little-known Species of Phytophagous Coleoptera from Africa and Madagascar. Trans. Ent. Soc. London, 1888, pp. 189-206, pl. vii. [4 new genera, 21 new species.]

37. Descriptions of some New Species of Phytophagous Coleo-

ptera. Entom. Monthly Mag. xxv. 1889, pp. 203-206. [6 new species.]

38. List of the Phytophagous Coleoptera obtained by Signor Modigliani at Nias and Sumatra, with Descriptions of the New Species. Ann. Mus. Civ. Genova (2) vii. 1889 (1890), pp. 278-287 pl. iv. [1 genus, 6 species.]

39. List of Crioceridæ, Cryptocephalidæ, Chrysomelidæ, and Galerucidæ collected in Venezuela by M. Simon, with Descriptions of the New Species. Proc. Zool. Soc. London, 1889, pp. 263-292 [43 new species.]

40. List of the Phytophagous Coleoptera obtained by Signor L. Fea at Burmah and Tenasserim, with Descriptions of the New Species. Ann. Mus. Civ. Genova (2) vii. 1889 (1890), pp. 147-237. [5 new genera, 81 new species.]

41. Descriptions of some New Species of South American Halticidæ of the group *Ædipodes*. Ent. Monthly Mag. (2) i.-xxvii. 1890, pp. 45-47, 67-69. [9 new species.]

42. Descriptions of New Species of Phytophagous Coleoptera received by Mr. J. H. Leech from Chang Yang, China. Entom. xxiii. 1890, pp. 84-89, 114-118, 161-167, 193-197, 214-217, pls. i.-ii. [2 new genera, 39 new species.]

43. Descriptions of Two New Species of Phytophagous Coleoptera from the East. Entom. xxiii. 1890, pp. 253-254. [2 new species.]

44. Descriptions of some New Species of Phytophagous Coleoptera from India. Entom. xxiv. 1891, Suppl. pp. 31-34. [10 new species.]

45. On some New Species of Phytophagous Coleoptera from Various Regions. Entom. xxiv. 1891, Suppl. pp. 35-41. [14 new species.]

46. Descriptions of some New Species of Phytophagous Coleoptera. Entom. xxiv. 1891, Suppl. pp. 62-65. [7 new species.]

47. Descriptions of some New Species of Phytophagous Coleoptera, and Synonymic Notes. Entom. xxv. 1892, Suppl. pp. 86-88. [7 new species.]

48. Descriptions of some New Genera and Species of Phytophagous Coleoptera from Madagascar. Proc. Zool. Soc. London, 1892, pp. 564-579, pl. xxxix. [5 new genera, 28 new species.]

49. Viaggio di Leonardo Fea in Birmania e regioni vicine. LI. Description of the New Genera and Species of the Phytophagous Coleoptera. Ann. Mus. Civ. Genova (2) xii. 1892, pp. 869-999. [6 new genera, 155 new species.]

50. Description of a New Genus of Phytophagous Coleoptera from Africa. Ent. Monthly Mag. xxix. 1893, pp. 275-276. [1 new genus, 1 new species.]

51. Descriptions of some New Species of Donaciinæ and Criocerinæ contained in the Brussels Museum and that of my own. Ann. Soc. Ent. Belg. xxxvii. 1893, pp. 261-271. [16 new species.]

52. Descriptions of some New Genera and New Species of Halticidæ. Trans. Ent. Soc. London, 1893, pp. 145-158. [2 new genera, 22 new species.]

53. Descriptions of some New Species of Eumolpidæ and Halticidæ from Africa (Gaboon). Entom. xxvi. 1893, Suppl. pp. 97-101. [1 new genera, 10 new species.]

54. Notes on some Species of Galerucidæ. Entom. xxvi. 1893, Suppl. 102-103. [1 new genus.]

55. Descriptions of some New Species of Phytophagous Coleoptera from the East. Entom. xxvi.-xxviii. 1893-95, Suppl. pp. 105-111. [13 new species.]

56. Descriptions of some New Species of Phytophagous Coleoptera from Bolivia. Ann. Soc. Ent. Belg. xxxvii. 1893, pp. 272-281 [18 new species.]

57. Descriptions of New Genera and Species of Phytophagous Coleoptera obtained by W. Doherty in the Malayan Archipelago. Novit. Zool. i. 1894, pp. 267-330. [4 new genera, 140 new species.]

58. Descriptions of New Genera and Species of Phytophagous Coleoptera from Africa and Madagascar. Novit. Zool. i. 1894, pp. 508-554. [2 new genera, 45 new species.]

59. Descriptions of some New Genera and Species of Phytophagous Coleoptera contained in the Collection of the Brussels Museum and my own. Ann. Soc. Ent. Belg. xxxviii. 1894, pp. 184-197. [2 new genera, 18 new species.]

60. Descriptions of New Species of Coleoptera of the Genera *Ædionychis* and *Asphæra*. Proc. Zool. Soc. London, 1894, pp. 609-631, pl. xxxviii. [43 new species.]

61. Contributions to the Knowledge of African Phytophagous Coleoptera, I.-II. Trans. Ent. Soc. London, 1895, pp. 159-179, 317-341. [1 new genus, 65 new species.]

62. Chrysomeliden von Togo (Bismarckburg). Deutsche Ent. Zeitschr. 1895, pp. 165-188. [29 new species.]

63. Descriptions of New Species of Phytophagous Coleoptera from the Indo- and Austro-Malayan Regions. Stettin. Ent. Zeitg. lvi. 1895, pp. 52-80. [41 new species.]

64. [=129]. New Species of Phytophagous Coleoptera from Madagascar, collected by E. and B. Perrot, in the Collection of R. Oberthur. Novit. Coleopt. i. 1895, pp. 1-6.* [1 new genus, 5 new species.]

65. Descriptions of the New Genera and Species of Phytophagous Coleoptera obtained by Mr. Andrewes in India, I.-II. Ann. Soc. Ent. Belg. xxxix. 1895, pp. 252-288; xl. 1896, pp. 250-304. [8 new genera, 115 new species.]

66. Description of the New Genera and Species of Phytophagous Coleoptera obtained by Dr. Modigliani in Sumatra. Ann. Mus. Civ. Genova (2) xvi.-xxxvi. 1896, pp. 377-501. [3 new genera, 145 new species.]

67. List and Descriptions of the Phytophagous Coleoptera by Dr. Modigliani from Mentawai Islands. Ann. Mus. Civ. Genova (2) xvii.-xxxvii. 1896, pp. 126-148. [28 new species.]

68. Remarks on the System of Coloration and Punctuation in the Beetles of the Genus *Calligrapha*. Proc. Zool. Soc. London, 1896, pp. 224-225.

69. Descriptions of some New Species of Phytophagous Coleoptera from the Loo-choo Islands. Entom. xxix. 1896, pp. 5-8. [7 new species.]

70. On some Species of Phytophagous Coleoptera collected by Captain V. Bottego in Central and Southern Somaliland. Ann. Mus. Civ. Genova (2) xvii.-xxxviii. 1897, pp. 336-338. [2 new species.]

71. New Species of South American Eumolpidæ. Entom. xxx. 1897, pp. 168-170, 193-196, 216-218. [11 new species.]

72. Descriptions of Some New Species of Clythridæ and Eumolpidæ. Entom. xxx. 1897, pp. 261-264. [5 new species.]

73. A List of the Phytophagous Coleoptera obtained by Mr. H. H. Smith at St. Vincent, Grenada and the Grenadines, with Descriptions of New Species: Crioceridæ; Galerucidæ. Trans. Ent. Soc. London, 1897, pp. 249-376. [21 new species.]

74. List of the Phytophagous Coleoptera obtained by Mr. H. Raap in the Batu Islands, with Descriptions of the New Species. Ann. Mus. Civ. Genova (2) xviii.-xxxviii. 1897, pp. 405-411. [1 new genus, 5 new species.]

75. Further Contributions to the Knowledge of the Phytophagous Coleoptera of Africa, including Madagascar, I.-II. Proc. Zool. Soc. London, 1897, pp. 238-265, 527-577, pls. xvii. xxxiv. [10 new genera, 115 new species.]

76. Descriptions of some New Species of Phytophagous Coleoptera from India. Ann. Soc. Ent. Belg. xli. 1897, pp. 420-424. [6 new species.]

77. List of the Phytophagous Coleoptera obtained by Mr. W. L. Distant in the Transvaal, with Descriptions of the New Species. Ann. Mag. Nat. Hist. (7) i. 1898, pp. 344-360. [1 new genus, 13 new species.]

78. Descriptions of some New Species of Indian Phytophagous Coleoptera. Ann. Soc. Ent. Belg. xlii. 1898, pp. 185-190. [10 new species.]

79. New Species of Phytophagous Coleoptera from Australia and the Malay Regions. Ann. Soc. Ent. Belg. xlii. 1898, pp. 350-380. [4 new genera, 51 new species.]

80. On some Phytophagous Coleoptera (Eumolpidæ) from the Islands of Mauritius and Réunion. Trans. Entom. Soc. London, 1898, pp. 113-120. [6 new species.]

81. Additions to the Knowledge of the Phytophagous Coleoptera of Africa, I.-II. Proc. Zool. Soc. Lond. 1898, pp. 212-242, pl. xxii.; 1899, pp. 339-380, pl. xxi. [6 new genera, 93 new species.]

82. Descriptions of some New Species of *Doryphora*. Entom. xxxi. 1898, pp. 52-56. [7 new species.]

83. Descriptions of Eight New Species of South American Chrysomelidæ. Entom. xxxi. 1898, pp. 162-166. [7 new species, 1 new variety.]

84. Descriptions of New Species of South American Phytophagous Coleoptera. Entom. xxxii. 1899, pp. 247-250, 270-273. [13 new species.]

85. Some New Genera and Species of Phytophagous Coleoptera collected during Captain Bottego's last Expedition. Ann. Mus. Civ. Genova (2) xix.-xxxix. 1899, pp. 521-535. [2 new genera, 16 new species.]

86. Descriptions of Two New Species of Phytophagous Coleoptera from the Island of Nias. Ann. Mus. Civ. Genova (2), xix.-xxxix. 1899, pp. 625-627. [2 new species.]

87. Some New Genera and Species of Phytophagous Coleoptera from India and Ceylon. Entom. xxxii. 1899, pp. 67-70, 80-83. [1 new genus, 11 new species.]

88. Remarkable Position of Eyes of *Chalænus*. Entom. xxxii. 1899, p. 98.

89. Descriptions of the New Species of Phytophagous Coleoptera obtained by Dr. Dohrn in Sumatra. Stett. Ent. Zeitg. lx. 1899, pp. 259-312, pl. [4 new genera, 62 new species.]

90. Bemerkungen über einige abnorme Structur-Verhältnisse einer Käfergruppe. Ins.-Börse, xvi. 1899, p. 46.

91. New Species of Phytophagous Coleoptera from Paraguay. Ann. Mus. Civ. Genova (2), xx.-xl. 1899, pp. 177-190. [16 new species.]

92. Descriptions of New Species and a New Genus of South American Eumolpidæ, with Remarks on some of the Genera. Trans. Ent. Soc. London, 1900, pp. 453-510. [1 new genus, 77 new species.]

93. On New Genera and Species of Phytophagous Coleoptera from South and Central Africa. Proc. Zool. Soc. London, 1900, pp. 203-266, pl. xx. [3 new genera, 98 new species.]

94. New Species of Indian Phytophaga principally from Mandar in Bengal. Mém. Soc. Ent. Belg. vii. 1900, pp. 95-140. [4 genera, 67 species.]

95. Descriptions of some New Species of Criocerini from the Malayan Region. Stett. Ent. Zeitg. lvi. 1900, pp. 382-388. [8 new species.]

96. Descriptions of Two New Species of *Hermesia* (Chrysomelidæ, fam. Eumolpidæ). Ann. Mus. Civ. Genova (2), xx.-xl. 1900, pp. 351-353. [2 new species.]

97. Descriptions of some New Species of Phytophagous Coleoptera of the Family Chlamydæ. Proc. Zool. Soc. London, 1901, pp. 153-164, pl. xiv. [14 new species.]

98. Descriptions of some New Genera and Species of Phytophagous Coleoptera from Madagascar. Ann. Soc. Ent. Belg. xlv. 1901, pp. 287-303. [3 new genera, 21 new species.]

(To be continued.)

DESCRIPTION OF A NEW PARASITIC BEE (*NOMADA*) FROM BORNEO.

By P. CAMERON.

Nomada malayana, sp. nov.

Black; the thorax red, the second abdominal segment with a somewhat pyriform transverse white mark, broad and rounded on the inner side, gradually narrowed from the inner to the outer side; there is a broad transverse line on the fifth and sixth segments; base of

antennal scape, the terminal antennal joint, the anterior tarsi, and the apex of clypeus, rufous; mandibles of a paler rufous colour, their base tinged with yellow. Wings hyaline, their apex with a narrow cloud; the stigma dark fuscous, the nervures black. ♀. Length, 5-6 mm.

Kuching, Borneo (John Hewitt, B.A.).

Face, front, pleuræ, and lower half of the sides of metanotum broadly covered with white pubescence. Head and thorax closely, distinctly punctured, the former more strongly than the latter. Metanotal area clearly defined, broadly roundly narrowed behind, closely reticulated, its centre black. Legs covered thickly with white pubescence; the calcaria white. The first transverse cubital nervure is sharply, obliquely sloped from below the middle in front; the shorter posterior part is less steeply, obliquely sloped; the second is broadly roundly curved outwardly; the first recurrent nervure is received near the base of the apical fourth of the cellule. Abdomen very smooth and shining, the apical margins of the segments not depressed. The clypeus is more strongly punctured than the front, its apex is a little raised; narrowly rufous, there being also a wider rufous line down the centre. There is no keel between the antennæ.

A distinct species.

NOTES AND OBSERVATIONS.

MECONEMA VARIUM; A CORRECTION.—In the 'Entomologist' for November, 1880, p. 252, the little leaf-cricket bred from the galls made on the oaks by *Cynips kollari*, and which Mr. Bignell saw emerge in the month of May, were, as is evident from the spotted legs of the one that has served for illustration, the young of *Odon-tura punctatissima*, said to frequent oak-trees, and not those of the verdant *Meconema varium* found on limes and on rose-bushes. This mistake has taken its origin from a remark made by Leopold Fischer in his 'Orthoptera Europæa,' p. 241. I have found both these little creatures in the garden here in Devonshire at the close of the year.—A. H. SWINTON; Totnes.

[Whether the Orthoptera bred from galls of *Cynips kollari* were *Meconema varium* or *Leptophyes punctatissima*, they were in either case Locustid grasshoppers and not crickets. As regards the full-grown grasshoppers, *L. punctatissima* is spotted, or rather irrorated, while *M. varium* is not. But these specimens were so young that unless both species had been bred from the egg and we could make a comparison, it would scarcely be safe to say that Fitch (who wrote the article) is wrong. Possibly, too, Bignell may have bred them through. *Meconema varium* is very common on oaks in the New Forest; it would fare badly there for lime-trees. *L. punctatissima* is generally found on low-growing plants. Still the spotted appearance of the insect figured leads one to suspect *L. punctatissima*.—W. J. L.]

GENITALIA OF THE BRITISH NOCTUIDÆ. — We have received intimation that Mr. F. N. Pierce, F.E.S., is about to publish a work under the above title. As practically the genitalia of all the British species of Noctuidæ have been examined by Mr. Pierce, and as drawings of these will be given, the work should be indispensable to entomologists. The cost of production will be considerable no doubt, and the author, who proposes to issue the book at the low figure of five shillings, will be glad to secure as large a number of subscribers as possible. His address is The Elms, Dingle, Liverpool.

CAPTURES AND FIELD REPORTS.

MAMESTRA (HADENA) GLAUCA AND ACRONYCTA MENYANTHIDES IN GLAMORGAN.—While looking for *Macrothylacia rubi* on May 22nd, 1907, on the hills between Merthyr and Aberdare, I came upon two fine specimens of *M. (H.) glauca* sitting on a clump of heather. Further searching on subsequent occasions produced a few more specimens resting on an old wall which runs across the hill. In May of this year several specimens of the insect were again taken in the same place, and while searching for it on June 6th in another locality on the same hill I found both it and several fine specimens of *A. menyanthides* sitting on heaps of stones which are scattered over the mountain side. Other specimens of the latter species were observed at intervals up to June 20th. I am not aware that either of these species has been taken previously in this district.—G. FLEMING; 9, Fairview Terrace, Merthyr Tydfil.

LARVÆ OF CIRRHÆDIA XERAMPELINA HATCHING IN DECEMBER.—From some ova of *C. xerampelina*, which I had kept outdoors under usual conditions, larvæ hatched out on the 13th inst. Is not this unusual, seeing that the ash-buds at present are very small and apparently too hard for such young larvæ to penetrate? On 10th inst. I took (here) a larva of *Lasiocampa quercus*; it was unusually active, and crawling across a sunny doorstep.—HERBERT W. BAKER; 73, Limetree Place, Stowmarket, Suffolk, December 12th, 1908.

PIERIS BRASSICÆ IN DECEMBER.—On December 16th I found a number of larvæ of *P. brassicæ* feeding on cabbage in my garden here.—W. JARVIS; 22, Leicester Road, Lewes, Sussex.

[Our correspondent kindly sent half a dozen of these larvæ, one or two of which were then nearly full grown, and have since pupated. It will be remembered that Mr. Frohawk (Entom. xli. 39) recorded three larvæ of *P. brassicæ* at Rayleigh, Essex, on January 4th, 1908.]

PIERIS RAPÆ IN DECEMBER.—I have an evidently fresh specimen of *P. rapæ*, which was captured on December 10th of this year. This seems to be a most extraordinary time of year for this butterfly to be on the wing, and I can only account for it by the fact that we have had such a phenomenally mild autumn, though I have not heard of other examples having been seen. I may add the butterfly is still alive (December 15th, 1908).—GEOFFREY MEADE-WALDO; Hever Warren, Hever, Kent.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, Nov. 18th, 1908.*—Mr. H. Rowland-Brown, M.A., Vice-President, in the chair.—Dr. Millais Culpin, M.B. (Lond.), F.R.C.S., of the Palace Hotel, Shanghai: Mr. E. M. Eustace, of Challacombe Rectory, Parracombe, R.S.O., North Devon; Captain F. H. Hardy, R.A.M.C., Medical Officer of the British Central Africa Protectorate; Mr. Jens M. A. Knudsen, of Noerre Nebel, Denmark; Captain Leonard Paul, of Brook House, Eastry, S.O., Kent; and Mr. B. C. S. Warren, of The Avenue, Amersham, Bucks, were elected Fellows of the Society.—Mr. E. C. Bedwell exhibited examples of the rare weevil *Procas armillatus*, taken in Sherwood Forest in 1908; and specimens of *Phyllobius argentatus* and *P. maculicornis* with deciduous mandibles attached.—Mr. P. de la Garde sent for exhibition specimens of the following new and rare Coleoptera:—*Laccobius purpurascens*, Newbery, recently described as new to science; *Ceuthorrhynchus parvulus*; and *Phyllotreta diademata*, recent additions to the British list; *Arena octavii*, *Sibinia sodalis*, *Neuraphes longicollis*, *Cardiophorus equisiti*, rare and local species; and a species of *Choleva*, right-hand maxillary palpus in triplicate.—Mr. W. S. Sheldon exhibited a specimen of *Anthrocera achilleæ*, from Oban, one of those taken by Mr. Renton and recently recorded as British, with forms of the species from the South of France; and of *A. filipendulæ* and *A. exulans* from Scotland, for comparison.—Mr. R. M. Prideaux, a gynandromorphous specimen of *Lycæna zephyrus* var. *lycidas* from the Simplon, taken in July last; an example of *Chrysophanus alciphron* var. *gordius* ab. female *midas*, Lowe, from below Salvan in the Rhone Valley; and a striking aberration of *Melitæa didyma* with the spots of the lower wings coalescent in thick splashes, captured near Bérisal in July, 1905.—Mr. A. Harrison, the resulting series obtained by cross pairings of successive broods of *Pieris napi* var. *bryoniæ*. He said that as a demonstration of Mendelian proportions they were quite negative. So far it would appear that the *bryoniæ* characters were not transmitted by the male, but in an exaggerated degree by the female.—Mr. L. W. Newman read a note on the life-history, and exhibited examples, of the imago of *Polygonia c-album*. He said that his observations led him to conclude that the first twelve to twenty ova laid by the hibernated females are the only ova which produce the var. *hutchinsoni*, and that this variety is the only form which pairs and produces the second brood.—Dr. Karl Jordan exhibited examples of *Charaxes zoolina*, and its nearest allies *C. betsimiseraka* and *betanimena* from Madagascar, *zoolina* and *neanthes* from East Africa, *phanara* and *ekinkei* from West Africa, and *kahldeni* and *homeyeri* from West Africa. This exhibit confirmed the result of Mr. G. F. Leigh's breeding experiment mentioned by Professor E. B. Poulton at the last meeting.—Dr. F. A. Dixey, specimens of the genera *Colaenis*, *Heliconius* and *Pereute*, to illustrate a mimetic relation between *C. telesiphe*, Hew., *H. telesiphe*, Doubl., and *P. antodyca*, Boisd.—The Rev. G. Wheeler, a pair of *Melitæa dictynna* var. *dictynnoides* Horm., received from Herr Hormuzaki. They are the converse of *M. britomartis*, having the upper side of *dictynna* but the under much nearer to *parthenie*. This form is usually described as a

var. of *aurelia*, Nick., but as almost typical *aurelia*, a specimen of which was exhibited, are found at the same place, Mt. Cecina, near Czernowitz, Bukowina, this seems unlikely.—Mr. Edward Meyrick B.A., F.R.S., communicated a paper entitled "Descriptions of Micro-Lepidoptera from Bolivia and Peru."

December 2nd, 1908.—Mr. C. O. Waterhouse, President, in the chair.—Mr. Sydney Douglas Crompton, of Carlton House, Kew Gardens, S.W., and Mr. W. Parkinson Curtis, of Aysgarth, Poole, Dorset, were elected Fellows of the Society.—Mr. H. W. Andrews exhibited some examples of predaceous Diptera and their victims, taken during the year; and a specimen of *Bassus latatorius*, Fab., female, bred from a pupa of the dipteran *Syrphus balteatus*, Dej.—Professor T. Hudson Beare and Mr. H. St. John Donisthorpe brought for exhibition specimens of *Olophrum assimile*, Payk., a beetle new to the British fauna, taken by them in September, 1908, at Nethy Bridge. Mr. Donisthorpe also showed examples of *Trechus longicornis*, Stm., from Kelton, near Dumfries; and of an *Anaspis*, either referable to *septentrionalis*, Champion, or new to the British list, taken in woody fungus at Nethy Bridge, this being probably the third specimen discovered.—Mr. G. C. Champion expressed his opinion that the *Anaspis* in question did not belong to the species described by himself or by Schilsky, but was *A. melanostoma*, an identification rejected by the exhibitor on account of the male characters.—Mr. G. T. Porritt exhibited forms of *Abraxa grossulariata* bred from wild Huddersfield larvæ during the past year, with two males of the var. *varleyata*, showing how wide a range of variation there is, even in the variety.—Mr. L. W. Newman also exhibited an extreme form of *varleyata*, the whole of the fore wings being coal-black, and only a very narrow white band on hind wings.—Mr. W. J. Kaye exhibited a fine series of *Heliconius* species from Mapiri River, North Bolivia, to show the close parallel variation between the very variable forms of *melpomene* with the equally variable forms of *phyllis*. Mr. R. J. Beck brought for exhibition variant forms of *Adalia bipunctata* L., from Alton and Farnham; examples of *Lixus paraplecticus* taken on *Sium angustifolium*, resembling small pieces of driftwood; and a specimen of *Leptura sanguinolenta*, taken at Southampton, by sweeping Umbelliferae.—Mr. W. Schmassman showed a case containing specimens of *Pyrameis atalanta*, which had been subjected in the pupal stage to various degrees of temperature.—Mr. F. Merrifield exhibited, on behalf of Mr. Reuss, of Ware, Herts, a remarkable aberration of *Aglais urticae*, bred in October, 1906, from wild autumn larvæ, the pupa being exposed to the direct rays of the sun; and interesting as showing the transition of one form of *Vanessa* markings to the other.—Dr. F. A. Dixey, specimens of South American and African butterflies, remarking that since the last meeting Mr. W. F. H. Rosenberg had kindly furnished him with fresh evidence tending to show that *Colaenis telesiphe*, though cryptically coloured beneath, was at least as common as *Heliconius telesiphe*, and was therefore not likely to be a Batesian mimic of that species. He added that *Belenois thysa*, which had often been spoken of as a Batesian mimic of *Mylothris agathina*, had been found by Mr. H. W. Simmonds to be much commoner at Berea, Durban, than its model. This confirmed an observation made by Dr. Longstaff and the speaker at Congella, near Durban, in 1905.—H. ROWLAND-BROWN, M.A., Hon. Secretary.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 12th, 1908.—Mr. Alfred Sich, F.E.S., President, in the chair.—Mr. P. N. Baker, of Stratford, was elected a member.—Mr. Kaye exhibited bred and captured series of *Melitæa aurinia* from Kent; the former, large and of vivid colour, were reared in a humid orchid house, and were referable to var. *provincialis*.—Messrs. Harrison and Main, several extensively xanthic specimens of *Epinephele jurtina* (*janira*) taken in North Cornwall.—Mr. R. Adkin, a series of *Coremia ferrugata*, bred from ova; the larvæ were fed on common *Galium*, and would not touch ground ivy.—Mr. H. Moore, specimens of the tsetse-fly (*Glossinia palpalis*?) from near Lake Chad, one of the mediums of the terrible "sleeping sickness."—Mr. Newman, a series of the hybrid *Smerinthus ocellata-populi*, bred in August, 1908, from a pairing in June, 1908, including two perfect gynandromorphs; and also a rayed specimen of *Abraxas grossulariata* ab. *varleyata*, female bred on November 11th, a second-brood specimen.—Mr. West (Greenwich), a series of the rare and recently discovered species *Aleochara crassiuscula*, taken at Lewisham, a new locality.—Mr. Main, a series of photographs of the life-history of *Pieris brassicæ*.—Dr. Hodgson and Mr. Grosvenor, a long series of *Anthrocera trifolii*, illustrative of their recent investigation of the species, and including, among other forms, some dozen fine ab. *obscura*.—Mr. Coote, a specimen of a third brood of *Celastrina argiolus*, bred on October 18th from a September larva.—Mr. Smith, a bred melanic example of *Cleora glabraria* from the New Forest.—Mr. H. J. Turner, a considerable number of species of Lepidoptera taken in Switzerland (Zermatt, Vissoye, Binn, and Saas Fée) by Dr. Chapman, including a small race of *Erebia ceto*, *E. mnestra*, *E. gorge*, *E. lappona*, *Æneis ællo*, very silvery *Argynnis niobe*, a three-spotted female of *Epinephele lycaon*, and a curious aberration of *Brenthis euphrosyne*. The remainder of the evening was devoted to the exhibition of lantern slides by Messrs. Dennis, West (Ashstead), Tonge and Main.—HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY. — November 4th.—Mr. R. G. Benton exhibited *Tryphæna comes* with hind wings clouded with black, Folkestone, July, 1908. — Mr. G. G. C. Hodgson, *Pieris rapæ* bred from Redhill larvæ, the pupæ having been subjected to alternate spells of high and low temperatures; the imagines showed an intensification of the yellow coloration on the under sides, thus resembling Scotch specimens.—Mr. L. W. Newman, a long series of hybrids from *Smerinthus ocellatus* male and *S. populi* female, the percentage of females being very small. Rev. C. R. N. Burrows stated that an examination of the genitalia showed that while the males were fully developed, the females were gynandromorphous.—Mr. A. E. Tonge, a specimen of *P. brassicæ* from Surrey, with a partial narrow black border on the hind wings.—S. J. BELL, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The opening meeting of this Society was held on October 19th, at the Royal Institution, Colquitt Street, Liverpool, Mr. William Mansbridge, Vice-President, in the chair. The meeting was exhibitional in character, the members showing results of the season's work.—

Mr. Robert Tait, Jr., brought a long series of *Agrotis agathina* bred from Welsh larvæ, and noted that the red form occurred much more frequently among wild imagines than among moths bred at Manchester from larvæ taken on the same ground earlier in the year. From the Isle of Wight, fine species of the following:—*Agrotis lunigera*, *A. cinerea*, *Acidalia humiliata*, *Setina irrorella*. From Pendine, South Wales:—*Boarmia repandata* var. *conversaria*, *Callimorpha dominula*. From Lakeside:—*Numeria pulveraria*, *Tephrosia consonaria*, and a very long series of *S. biundularia*, varying from almost white to the extreme form of var. *delamerensis*. Mr. Tait stated that he had bred a partial second brood of the following species, viz.:—*B. repandata* var. *conversaria*, *Aplecta herbida*, and *A. humiliata*, a living example of which he exhibited at the meeting.

—Mr. Mounfield, of Warrington, showed a fine series of *Lithosia sericea*, and *Leucania pallens*, a red variety from Warrington; *Maccaria liturata* var. *nigrofulvata*, a short series from Delamere Forest.

—Mr. Robinson, of Warrington, also exhibited *L. sericea*, as well as *Hydrecia petasitis*, *H. lucens*, *H. nictitans*, *H. paludis*, *Hadena glauca*, *Orthosia suspecta*, *Agrotis nigricans*, and *Acronycta leporina* var. *melanocephala*, all from Warrington and neighbourhood; while from Delamere Forest he showed *Aplecta nebulosa* var. *robsoni* and *Lithosia mesomella*.

—Mr. T. Baxter, of St. Anne's, sent a long series of *Abraxas grossulariata* and varieties, from St. Anne's, and short series of *Polia chi* vars., including *olivacea* and melanic forms from Yorkshire; also strongly marked typical specimens of this variable moth from Barmouth.

—Dr. Edwards had series of *Abraxas sylvata* and *Noctua glareosa*, from Carnarvon; *Eupithecia pulchellata* from the Lake District; *Dasychira fascelina*, from Forinby; *Celena haworthii* and *Luperina cespitis*, from Delamere Forest.

—Mr. Prince sent several boxes of local insects, including a very long series of *Nyssia zonaria*.

—Mr. H. R. Sweeting exhibited *Aplecta nebulosa* and var. *robsoni*, and *Boarmia repandata*, from Delamere; *Cucullia asteris*, from Essex; *Moma orion*, bred from New Forest pupæ which had laid over two winters.

—Mr. W. J. Lucas, of Kingston-on-Thames, sent a number of excellent photographs of Lepidoptera.

—Dr. Bell had several varieties of *Bombyx quercus* from Wallasey, including the olive variety; Dr. Bell stated that the larvæ from which the olive forms were bred were black with very dark brown hairs; this had also been noted by other collectors, and was supported by a further exhibit, by the same member, of young larvæ from olive parents, and from typical parents in which this difference was well seen.

—Mr. Mallinson brought a specimen of *Deilephila galii*, bred from one of the two larvæ found at Wallasey, September, 1907.

—Mr. W. Mansbridge exhibited a series of *Aplecta nebulosa* var. *robsoni*, very dark grey forms, and var. *pallida*, bred 1908; *Polia chi* var. *olivacea*, from near Leeds; and stated that this form had increased from about five per cent. noted in 1890-1, to about twenty per cent. noted this year. A series of black *Boarmia repandata*, from Knowsley, Lancashire, and a male *Porthesia similis*, from Simonswood, without the black spots on the hind margin of the fore wings; a short series of *Peronea permutana*, from Wallasey.

—H. R. SWEETING & WM. MANSBRIDGE,
Hon. Secs.

RECENT LITERATURE.

1. *Three Related American Species of Aeschna (Odonata)*—*A. multicolor*, Hag., *A. mutata*, Hag., and *A. jalapensis*, nov. sp.
2. *A New Dragonfly (Odonata) belonging to the Cordulinae, and a Revision of the Classification of the Subfamily.* [The new species is *Platycordulia xanthosoma*.] Both by E. B. WILLIAMSON, 'Entomological News,' June, July, and November, 1908.

PROBABLY the general notes embodied in these two papers will be of most interest to English readers.

W. J. L.

The Annals of Scottish Natural History. Edinburgh. 1908.

NOT a great amount of entomological matter appears this year, but some of the articles and notes are of importance. These are—Notes on Coleoptera of St. Kilda (T. H. Beare); do.: mainly from Birds' Nests (N. H. Joy); Scottish Species of Oxyura (Proctotrypidæ), pt. iii. (P. Cameron); Lepidoptera of East Ross, &c., and on *Amblyptilus punctidactylus* (D. Jackson); Insect Fauna of Isle of May (P. H. Grimshaw); *Sirex noctilio* (Sawfly) in Forth, *Aleochara spadicea* (Coleopteron) in Scotland, *Quedius longicornis* (Coleopteron), in Forth, and *Bethylus cephalotes* (Proctotrypidæ) in Scotland (W. Evans); Death's Head in Kircudbrightshire (R. Service); *Palloptera ustulata* in Edinburgh and *Ceratophyllus borealis* in Berwickshire (J. Waterston).

W. J. L.

Descriptions of Tertiary Insects. By T. D. A. COCKERELL. (From 'The American Journal of Science,' vol. xxvi. pp. 69-75, July, 1908.)

THESE descriptions are illustrated by figures of three fossil dragonflies—*Lithagrion hyalinum*, Scudder, *Enallagma florissantella*, sp. nov., and *Trichonemis aliena*, Scudder.

Some Results of the Florissant Expedition of 1908. By Professor T. D. A. COCKERELL. (Reprinted from 'The American Naturalist,' vol. xlii. pp. 569-81, September, 1908.)

SOME of the most interesting fossils found in 1908 in the Florissant beds are discussed and illustrated by photographs. Among these are a dragonfly (*Phenacolestes parallelus*, Ckll.), and two bees (*Calyptapis florissantensis*, Ckll., and *Anthophora melfordi*, Ckll.).

The Agricultural Journal of India. Vol. iii., parts 1 and 2. Calcutta and London: Thacker & Spink and W. Thacker & Co. 1908.

THE contents of part i. (January, 1908) comprises an article by H. Maxwell-Lefroy, M.A., the Imperial Entomologist, on "The Tobacco Stem Borer (*Gnorimoschema heliopa*, Low.)." This is accompanied by an excellent coloured plate showing the insect in all stages.

In part ii. (April, 1908) the principal entomological contribution is that by M. Mackenzie and H. Maxwell-Lefroy, entitled "The Sugar-cane Borers of Behar." These borers are the larvæ of moths that attack the sugar-cane. Two species, *Scirpophaga auriflua* and *S. monostigma*, injure the shoots. Four others—*Chilo simplex*, *C. auricilia*, *Nonagria uniformis*, and *Anerastia abutella*—are described as "side-borers." The larva of *Polyocha saccharella* destroys the roots, and seems to be capable of causing more permanent mischief than either of the other "borers." All the moths, together with ova, larvæ, and pupæ, are well figured in colour on plate xx., and the methods of larval attack are shown on plates xxi. and xxii.

Memoirs of the Department of Agriculture in India. Vol. ii., Nos. 1, 2, 6. Calcutta and London: Thacker & Spink and W. Thacker & Co.

No. 1 (April, 1908, pp. 1-13). "The Rice Bug (*Leptocorisa varicornis*, Fabr.)." By H. Maxwell-Lefroy, M.A. The perfect insect and various stages from the egg are depicted in colour on plate i.

No. 2 (April, 1908, pp. 14-46). "Remarks on Indian Scale Insects (Coccidæ)." Part iii. By E. E. Green, F.E.S. Plates ii.-iv.

No. 6 (August, 1908, pp. 95-110). "The Cotton Leaf-roller (*Sylepta derogata*, Fabr.)." By H. Maxwell-Lefroy, M.A. The moth and its early stages are shown on plate ix., which is well executed in colour.

United States Department of Agriculture. Bureau of Entomology:—

Bulletin No. 64, pt. iv.: "An Injurious North American Species of *Apion*, with Notes of Related Forms." By F. H. Chittenden. Pt. v.: "Insects Injurious to the Loco Weeds." By F. H. Chittenden, Sc.D.

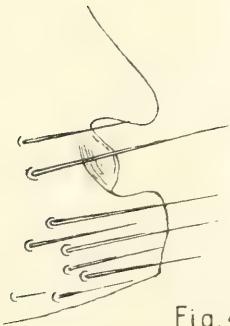
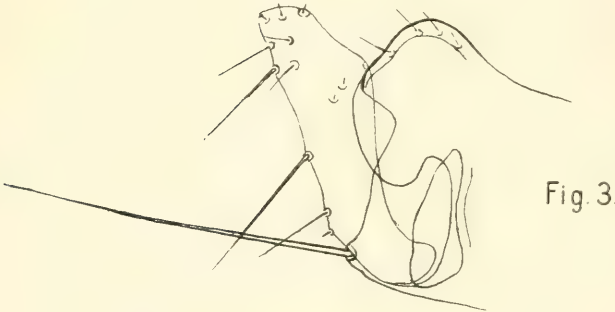
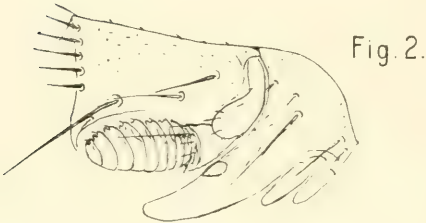
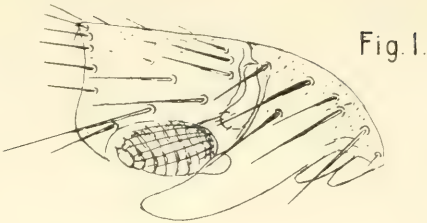
Bulletin No. 68, pt. vi.: "Grape Root-worm Investigations in 1907." By Fred Johnson. Pt. vii.: "Demonstration Spraying for the Codlin Moth."

Bulletin No. 75, pt. iii.: "Bee Diseases in Massachusetts." By Burton N. Gates.

Technical Series, No. 15: "A Revision of the Ixodoidea, or Ticks, of the United States." By Nathan Banks (June, 1908). No. 16, pt. i.: "The National Collection of Coccidæ." By C. L. Marlatt, M.S. (April, 1908). Pt. ii.: "New Species of Diaspine Scale Insects." By C. L. Marlatt, M.S. (August, 1908). No. 12, pt. vi.: "A Record of Results from Rearings and Dissections of Tachinidæ." By C. H. T. Townsend (September, 1908).

Report of the Entomological Department of the New Jersey Agricultural College Experimental Station, New Brunswick, N. J. By JOHN B. SMITH, Sc.D. For the year 1907. Trenton: MacCrellish Quigley. 1908.

OBITUARY.—We are very grieved to announce the death of Mr. J. A. CLARK. A further notice will appear in the February number.



K.J. del.

West. Newman proc.

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[No. 549

NOTES ON THE FIVE-COMBED BAT-FLEAS FORMING THE GENUS *NYCTERIDOPSYLLA*,* OUDEMANS.

BY THE HON. N. C. ROTHSCHILD, M.A., F.L.S., F.E.S.

(PLATE I.)

IN the December number of the 'Entomologist' for 1908, p. 281, we described a new species of five-combed bat-flea under the name of *Nycteridopsylla longiceps*, comparing it with another British species which we identified at that time as *pentactenus*, Kolenati. Our identification was based on specimens from Kolenati's collection preserved in the Vienna Museum, with which the British ones agree fairly well. This identification has now proved to be erroneous, and we think therefore that a general survey of all the known species of the genus *Nycteridopsylla* may be attempted with advantage.

1. *Nycteridopsylla pentactenus*, Kol.

Ceratopsyllus pentactenus, Kol., Parasiten der Chiropteren, p. 32, no. 3 (1856, Brunn).

C. tetractenus, Kol., Parasiten der Chiropteren, p. 32, no. 4 (1856, Brunn); *id.*, Hor. Soc. Ent. Ross. vol. ii. p. 39 (1863).

Nycteridopsylla pentactena (!), Oudemans, Tijdschrift voor Entomologie, Verslag, p. lix (1906); Dampf, Schrift. Phys.-ökon. Ges. vol. ii. p. 42 (1908, Königsberg).

Kolenati originally described two species in 'Die Parasiten der Chiropteren' under the names of *pentactenus* and *tetractenus*, which he subsequently united under the latter name in the 'Horæ Societatis Entomologicæ Rossicæ.' The description and figure are insufficient, but two characters are mentioned which refer to this species only. In the 'Parasiten der Chiropteren' Kolenati states, under *pentactenus*, that the second segment of

* *Nycteridopsylla*, Oudemans, Tijdschrift voor Entomologie, Verslag, p. lviii (1906).

the antenna bears six long bristles, while in the 'Horæ' the six bristles placed before the eye are noted as a character. In the specimens kindly forwarded to us by Dr. Oudemans there are five or six long bristles on the second segment of the antenna, while in the other two species of *Nycteridopsylla* there are only one to three of these long bristles. The second character, again, applies only to this species. We therefore concur with Dr. Oudemans in identifying this insect with *N. pentactenus* of Kolenati.

N. pentactenus is easily recognized by the head (Pl. I. fig. 1, ♂), the long bristles of the body, and the modified segments. The metathoracical sternite bears near the posterior edge a bristle which nearly reaches to the hind edge of the epimerum. The dorsal bristles of the thorax and abdomen are rather shorter than the lateral ones, while in the males of *eusarca* and *longiceps* the dorsal ones are prolonged. Dampf has given a fairly correct figure of the clasper of the male. The ninth sternite resembles that of *longiceps* (cf. Entom. 1908, Pl. VIII.), but the distal portion is more curved upwards, somewhat resembling the runners of a sleigh. The seventh abdominal sternite of the female is represented on our Plate (fig. 5). This sternite differs very essentially from that of the allied species. It has one sinus on each side, the lobe above the sinus being very broad and strongly rounded, while the lower lobe is narrow.

Dr. Oudemans obtained this species off *Vesperugo serotinus* at Arnheim, in Holland. There are no examples of it among those of Kolenati's specimens preserved in the Museum at Vienna, nor have we seen it from any other collection, with the exception of a single male example received from the Hazai Zoologiæ Laboratorium at Budapest, taken off *Plecotus auritus* in Hungary on December 15th, 1908. The species, however, may be expected to occur in Great Britain.

2. *Nycteridopsylla eusarca*, Dampf.

Nycteridopsylla eusarca, Dampf, Schrift. Phys.-ökon. Ges. vol. xlviii. p. 398 (1908, Königsberg); *id.*, l. c. vol. il. p. 45, fig. 3 (1908).

The head (Pl. I. fig. 2, ♂) bears only two long bristles on the frontal portion, and the club of the antenna is longer than in *pentactenus*. The dorsal bristles of the thorax and abdomen are prolonged in the male. The modified segments of both sexes are quite different from those of *pentactenus*. The non-movable process of the clasper of the male is short and broad, the apex being rounded, except on the distal side. The finger is much broader than in *pentactenus*, being widest above the centre. The seventh abdominal sternite of the female has a double sinus on each side as shown in Pl. I. fig. 4. The lobes of this sternite do not actually lie in one plane, as represented in the figure; the sinus therefore does not appear so large in an unmounted speci-

men as in a mounted (flattened) one. The size of the lobes varies somewhat in different individuals.

Kolenati's specimens in the Vienna Museum belong to this species. *N. eusarca* is widely distributed, and apparently the commonest of the five-combed bat-fleas. It appears to vary geographically, as the specimens before us from different countries do not exactly agree with one another. The material, however, from the Mediterranean countries which we have is quite insufficient to decide such a delicate point, and we therefore can at present establish but two geographical races.

(a) *Nycteridopsylla eusarca eusarca*, Dampf, l. c.

The author of *eusarca* has kindly given me in exchange a male and female of this form. These two specimens show that Dampf must have made a mistake when he especially stated that the head of *eusarca* did not bear any bristles along the posterior edge. All our specimens of this species have a row of bristles in that place, as in the allied species (Pl. I. fig. 2). The movable finger of the clasper of the male is rather broad, being but slightly narrowed towards its base. The eighth tergite of the male has three long bristles at the upper edge between the stigma and the apical margin, besides a few shorter ones on the side.

We have no specimens exactly agreeing with this form except the pair of co-types from East Prussia. A series of Austrian specimens are intermediate between *N. e. eusarca* and the British form described below, these Austrian specimens having the same small size as *N. e. eusarca*, while in the modified segments of the male they approach the British subspecies.

(b) *Nycteridopsylla eusarca major*, subsp. nov.

Ceratopsylla pentactenus, Saunders (nec Kolenati, 1856, err. determ.), Ent. Mo. Mag. (2), vol. iii. p. 66 (1892).

Nycteridopsylla pentactenus, Rothschild (nec Kolenati, 1856, err. determ.), Entom. vol. xli. p. 281 (1908).

Both sexes are distinctly larger than in *N. e. eusarca*. The eighth tergite of the male bears four long bristles at the dorsal edge distally to the stigma; the movable finger of the clasper, though varying somewhat in individual specimens, is always strongly widened above the centre on the proximal side (Pl. I. fig. 3); the non-movable process, moreover, is broader than in *N. e. eusarca*. The tibiæ have a few more lateral bristles on the inner and the outer side in both sexes. The lower lobe of the seventh sternite of the female is on an average broader than in Continental specimens.

We have three males off *Scotophilus noctula*, obtained by Dr. D. Sharp at Cambridge in January, 1892, and one male and five females from the same locality and host collected by Mr.

William Farren in 1900 and 1903. This species appears to be local in the British Islands. We have not found it or heard of it being taken on Noctules from any locality other than Cambridge.

3. *Nycteridopsylla longiceps*, Rothschild.

Ceratopsylla pentactenus, Rothschild (nec Kolenati, err. determ.), Novit. Zoolog. vol. ii. p. 66 (1895); *id.*, *l. c.* vol. v. p. 542 (1898).

Nycteridopsylla longiceps, Rothschild, Entom. xli. p. 281 (1908).

This species, when originally described in the 'Entomologist,' was, as stated above, compared with *N. eusarca major*, that form being then erroneously identified as the true *pentactenus*. The male of the present species can be recognized at once by the great length of the head. In the female, however, this difference is not so apparent, as in *eusarca* the length of the head is considerably greater in the female than in the male. The modified segments of both sexes of *longiceps* are very distinctive taxonomic characters. In the male the movable finger of the clasper is very broad, and the apex of the ninth sternite is very much more obtuse than in *N. eusarca*. The seventh sternite of the female has but a single sinus on each side, the lobe above the sinus projecting far less than the one below it.

We have received examples of this species from Great Britain, Firenze (Italy), and from Adana (Asia Minor). In fact, it appears to be the only member of the genus which is fairly widely distributed in the British Islands. Our British specimens have been collected from the following hosts: *Scotophilus pipistrellus*, *Plecotus auritus*, and *Vespertilio nattereri*.

4. *Nycteridopsylla bouchei*, Oud.

Nycteridopsylla bouchei, Oudemans, Tijdschrift voor Entomologie, Verslag, p. lix (1906).

Pulex vespertilionis, Bouché, Nov. Acta Acad. Leop. Carol. xvii. i. p. 508 (1835).

? *Typhlopsylla hexactenus*, Tasch., Die Flöhe, p. 89 (1880).

Dr. Oudemans renamed *Pulex vespertilionis* of Bouché under the above name, stating that he considers this insect to belong to his new genus *Nycteridopsylla* on account of its possessing an eye. In Bouché's original description no reference is made to an eye at all, and we are inclined to think that Taschenberg was correct in considering Bouché's species to be identical with *hexactenus* of Kolenati. Dr. Oudemans, however, is correct in rejecting the name *vespertilionis*, as it had previously been employed by both Curtis* and by Dugès.†

* *Ceratophyllus vespertilionis*, Samouelle, in Curtis, Brit. Ent. vol. ix. No. 417 (1832), though Samouelle never described or mentioned any *Pulex vespertilionis*.

† *Pulex vespertilionis*, Dugès (nec Bouché), Ann. d. Scienc. Nat. vol. xxvii. p. 161 (1832).

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 7.)

THERE are three principal directions in which the species of this group tend to vary, *viz.* size, the distribution of the usual colouring, and the approach on the upper side to the more variegated *Aurinia*-group. The first of these has already been touched on and in some cases accounted for, nor has it, taken alone, given rise to any varietal name, except in the one (probably mistaken) case of *varia*. Other sources of variation are the shape of the wings, which in some cases appears to be a local peculiarity, and the occasional approach on the under side to the *Cinxia*-group, which seems to be purely aberrational in character. Of the remaining directions of variation the approach on the upper side, especially in the female, to the *Aurinia*-group is perhaps the more widely interesting, but being in most cases by far the less conspicuous, it has not figured so largely as a cause of named varieties, and more particularly aberrations, as the unusual distribution of the ordinary colouring, and it is to the named forms that I wish now to direct attention. As a matter of personal opinion, I regard it as a somewhat unnecessary overloading both of the memory and of the "variety" list to name every intermediate form, though no doubt it serves here and there to recall to the minds of entomologists the names of some who have done valuable work which might otherwise be in danger of being forgotten—I allude to the *work* not the *names*; but on the whole it would seem better if extreme forms only were named, and intermediates merely regarded as "transition to so-and-so," or if all aberrant forms were called by the name of the well-marked form they most nearly resemble, and towards which they tend, without regard to the actual extent of the individual aberration. But as this is now far past hoping for, so many names having already been given, some of them a very long time back, it is at any rate as well that we should know the forms to which the names really apply, a knowledge which can only be gained by reference to the original descriptions; though it is still quite permissible to refer to the same name forms nearly resembling the originals, especially in the case of those that are rather aberrational than varietal in character. One can hardly help feeling that in general the desire to possess named varieties, and the love of writing "*mihi*," or seeing one's own name quoted, after the name of an insect, is more often responsible for the constant accumulation of aberrational names than any more scientific cause; and this accumulation has increased vastly since the time when Kingsley made such game

of the subject in the 'Water-Babies,' where he says that if the Professor's dignity had allowed him to examine Tom instead of throwing him back into the water, he would have given him two long Latin names, the first of which would have told a little about Tom and the second all about himself, as of course he would have called him "Hydroteknon Ptthmlnsprtsianum." It was a good skit then—it would be a better now.

Athalia, being by far the most generally distributed and perhaps also the most variable of the group, has naturally given rise to the largest number of named forms. We will take first those which depend on the unusual grouping of the ordinary black and fulvous of the upper side, a peculiarity usually, though not always, associated with more or less abnormality on the under side. The majority of these forms may be divided into two groups: in the first the fulvous, in the second the fuscous colour prevails.

In the first group the oldest named form appears to be *ab. corythalia*, Hübner, 'Beiträge,' vol. ii. pt. ii. tab. 3, *S, a, b* (1790).

In the remarks he makes on the illustration (p. 51) he expresses a doubt as to whether it is a good species or an aberrant form of *athalia*. He gives no description of it, but refers to the illustration in which both upper and under side are shown, and from which the following description is made:—

Up. s. f. w.: Mostly fulvous; a broad black border, to which the outer subterminal line appears to be joined, as there are no lunules; the inner subterminal narrow; the upper part of the elbowed line wanting; stigma black, triangular: two triangular black patches at the base, one on each side of the median nervure.

Up. s. h. w.: Blackish, except for one row of fulvous spots near the border.

Un. s. f. w.: Tip yellow, the rest of the wing fulvous, but with three short black dashes representing the costal part of the elbowed line, and a row nearer the base; the outline of the stigma and the space between the basal lines each contain darker colouring; below there is a basal dash.

Un. s. h. w.: Outer half pale yellow, inner half fulvous, divided by a strong black line; the light spot apparently replaced by a black one, and all the spots of the basal band black; outer band represented by a row of five orange spots, the central part being unrepresented.

This form, or something closely resembling it, has been treated by some of the older authors as a separate species. The name itself has, however, been variously employed. Hübner himself, in his 'Sammlung,' i. pl. 3, figs. 15, 16, appears to illustrate *dictynna* under this title; what Freyer meant when he mentions it incidentally in his account of *asteria* ('Beiträge,' i. p. 116, 1828) it would have been impossible to guess, but in the 'Neüere Beiträge,' iv. p. 49 (1852) he gives it as a synonym of *dictynna*, referring to the above-mentioned figure of Hübner.

ab. *hertha* was originally described by Quensel ('*Vetenskaps Academie nya Handlingar*, T. xii. p. 280, 1791) as a separate species, though it is really a form of *athalia* quite near to *corythalia* and *pyronia*. There are probably few forms of any of the group about which such a mistaken idea prevails; I have found but one instance—Lampa ('*Tidskrift*, 1889, p. 18)—of a description, which has been taken from Quensel's figure, *loc. cit.* pl. x. figs. 9 and 10, and it is certainly a case where it was necessary to consult the figure, for the original concise description is wholly inadequate. It runs as follows: "Alis subdentatis fuscis, suprâ anticis fascia maculari, posticis striga punctorum, fulvis." A much longer Latin description follows, calling attention to the many peculiarities not previously noticed. The figure is uncoloured though excellent, and for the colouring of the following description I have used the longer description of Quensel:—

Up. s. f. w.: The outer subterminal line sharply defined and no markings beyond it towards the base, except the large basal suffusion, which melts into the ground colour about one-third of the way across the wing; the ground colour would seem to be somewhat lighter than usual, as in the longer description the word *luteus* is substituted for *fulvus*.

Un. s. h. w.: As in *corythalia*, but with the light spot visible though obsolescent.

Un. s. f. w.: Ground colour dull yellow (*obscure luteus*), the only markings being an indication of the outer subterminal line bordering the brightish yellow (*flavescens*) lunules, the outlines of the lower half of the stigma (or possibly the central part of the basal lines), and between these a series of very narrow longitudinal dashes of unequal length, so narrow as to be mere thin lines, and utterly unlike the black dashes of *eos* and some other forms; none of them extend so far either as the basal markings in the one direction or the outer subterminal in the other.

Un. s. h. w.: Spots of basal band coalescent, of a dull yellow (*luteus*), and rather strongly edged with black; the inner band apparently represented by one dark (or black) spot; the inner part both of the central and outer bands black, the latter failing towards the costa; the outer band fulvous, the terminal and central of a bright yellow (*flavus*).

It will readily be seen that this is a very remarkable form on the under side, even among the *corythalia*-group of aberrations, especially so on account of the fore wing. Aurivillius ('*Nordens Fjärilar*, p. 29, 1888), in his description of this form, makes no mention whatever of the un. s. f. w., and my own observation ('*Butterflies of Switzerland*, &c., p. 91)—"with long black streaks un. s. f. w., but less black up. s. f. w."—is a very fair sample of the inadequacy of most modern descriptions.

ab. *pyronia*, Hübner, '*Sammlung*, i. pl. 114, figs. 585-588, ♂ and ♀ up. and un. s. (1804), is a modification of the same form, with less of the dark colour on the up. s. f. w., and a

light basal spot in addition to the row of fulvous spots on the up. s. h. w. On the un. s. f. w. are indications of the lines, and a dull darker band across the centre, both the black and the fulvous in the basal half of both wings being more concentrated. On the h. w. the lunular part of the outer band is present, and has a conspicuous black edging on both sides in the male, and on the inner side in the female.

Freyer's *pyronia* ('Neuerer Beiträge,' iv. p. 14, tab. 295, fig. 2 (1842)) has more black on the base of the up. s. f. w., and the black streaks and markings of the following form (*eos*) on the un. s. f. w. are all present, but so obsolescent as to be no longer at all striking.

ab. *eos*, Haworth, 'Lepidoptera Britannica,' i. p. 35 (1803) is illustrated, from the same specimen, in the 'Entomologist,' x. p. 145 (1877); it is also beautifully painted in Stephens's 'Illustrations,' i. pl. iv. figs. 1, 2 (1828): and again (very badly) in Humphreys & Westwood's 'Butterflies,' pl. viii. figs. 13, 14. It is a specimen taken "at Peckham, near London," in June, 1803, which was still, in 1877, in excellent preservation in possession of Mr. S. Stephens, F.L.S. It is very like the female *pyronia* illustrated by Hübner on the upper side, but the inner subterminal line is distinct throughout. On the under side the hind wing is also very near to *pyronia*, except for the terminal and outer bands being more definite, but the fore wing not only has the subterminal lines very distinct though narrow, but has also the spots representing the elbowed line produced into very large, conspicuous, black dashes, taking the place of the dark band in *pyronia*, on which three very small black dashes below the costa are alone visible. Another specimen almost identical was taken in Sussex on June 23rd, 1907, and mentioned and figured by Frohawk, Entom. xl. p. 193..

(To be continued.)

LIST OF PAPERS OF THE LATE MARTIN JACOBY.

BY GEORGE JACOBSON.

(Concluded from p. 16.)

99. Eine interessante Käfergruppe, die Chlamydæ. Ins.-Börse, xviii. 1901, p. 116.

100. Descriptions of Four New Species of *Disonycha* (Coleoptera Phytophaga, fam. Halticidæ). Entom. xxxiv. 1901, pp. 146-149. [4 new species.]

101. [and Sharp, D., and Kolbe, H.] Von Threr K. K. der Prinzessin Therese von Bayern auf einer Reise in Südamerika gesammelte Insekten. IV. Coleopteren. Berl. Ent. Zeitschr. xlv. 1901, pp. (463-486), t. vii. [1 new species.]

102. The Name *Micropyga*. Entom. xxxvi. 1903, p. 189.
103. A further Contribution to our Knowledge of African Phytophagous Coleoptera. I.-II. Trans. Ent. Soc. Lond. 1901, pp. 209-256, pl. x.; 1903, pp. 1-38. [8 new genera, 103 new species, 1 new variety.]
104. Descriptions of New Species of Coleoptera of the Family Halticidæ from South and Central America. Proc. Zool. Soc. London, 1902, pp. 171-204, pl. xx. [1 new genus, 63 new species.]
105. Descriptions of some New Species of Phytophagous Coleoptera from the Island of Mauritius. Entom. xxxv. 1902, pp. 203-205. [6 new species.]
106. Coleoptera Phytophaga Sagridæ. Wytsman, Genera Insect. No. 14, 1903, 11 pp., 1 tab.
Notes and additions, *ibid.* No. 14 bis, 1904, pp. 13-14.
107. Descriptions of New Genera and Species of Phytophagous Coleoptera obtained by H. Conradt in West Africa (Cameroons). Stettin. Ent. Zeitg. lxiv. 1903, pp. 292-336. [7 new genera, 47 new species.]
108. Descriptions of the New Genera and Species of Phytophagous Coleoptera obtained by Mr. H. L. Andrewes and Mr. T. R. D. Bell at the Nilgiri Hills and Kanara. Ann. Soc. Ent. Belg. xlvii. 1903, pp. 80-128. [9 new genera, 74 new species.]
109. Descriptions of New Species of South American Coleoptera of the Family Chrysomelidæ. Proc. Zool. Soc. London, 1903, ii. pp. 30-59. [57 new species.]
110. Phytophagous Coleoptera obtained by Prof. Sjöstedt in the Cameroons. Arkiv Zool. i. 1903, pp. 223-234, tafl. 10. [1 genus, 9 new species.]
111. Descriptions of some New Species and a New Genus of Chrysomelidæ from South America. Entom. xxxvi. 1903, pp. 169-170, 182-183, 209-211. [1 new genus, 10 new species.]
112. Descriptions of some New Species of Clythridæ (Phytophagous Coleoptera). Entom. xxxvi. 1903, pp. 62-64, 91-93. [1 new genus, 8 new species.]
113. Remarks on a supposed New Genus of Clythridæ (Col., Phytophaga) from Madagascar, described by M. Fairmaire. Ent. Monthly Mag. (2), xiv.-xxxix. 1903, p. 111.
114. Descriptions of some New Species of Phytophagous Coleoptera obtained by Baron E. Nordenskiöld in Bolivia and the Argentine Republic. Arkiv Zool. i. 1904, pp. 513-524. [9 new species.]
115. Another Contribution to the Knowledge of African Phytophagous Coleoptera. Proc. Zool. Soc. London, 1904, i. pp. 230-270, pl. xvii. [5 new genera, 63 new species.]
116. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Donacidae. Wytsman, Genera Ins. No. 21, 1904, 15 pp., 1 pl.
117. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Crioceridae. Wytsman, Genera Ins. No. 23, 1904, 40 pp., 5 pl.
118. Description of some New Species of Phytophagous Coleoptera. Entom. xxxvii. 1904, pp. 293-296. [5 new species.]
119. Descriptions of some New Species of Chlamydæ from South America. Entom. xxxvii. 1904, pp. 197-202. [8 new species.]
120. Descriptions of some New Species of Mastostethus (Phyto-

phagous Coleoptera). Entom. xxxvii. 1904, pp. 63-68. [10 new species.]

121. Descriptions of Thirty-two New Species of Halticinae (Phytophagous Coleoptera) from South and Central America. Proc. Zool. Soc. London, 1904, ii. pp. 396-413. [2 new genera, 32 new species.]

122. Another Contribution to the Knowledge of Indian Phytophagous Coleoptera. Ann. Soc. Ent. Belg. xlviii. 1904, pp. 380-406. [1 new genus, 43 new species.]

123. Mänchen oder Weibchen? Ins.-Börse, xxi. 1904, p. 301.

124. Was ist eine Art? Ins.-Börse, xxi. 1904, pp. 155-156; xxii. 1905, pp. 39-40.

125. Sagra Cambieri Duv. = Derchii Gestro. Ann. Soc. Ent. Belg. xlix. 1905, p. 99.

126. Report on the Phytophagous Beetles. Fasc. Malayens. iii. 1905, pp. 137, 139-148.*

Diagnoses of Phytophagous Coleoptera. Descriptions of New Malayan and one Bornean Species of Phytophagous Coleoptera L. c., App. ii. 1905, pp. i-vii. [10 new species.]

127. Resemblance of Chrysomelid with Trigona. Proc. Ent. Soc. London, 1905, p. xviii.

128. Descriptions of New Genera and Species of Phytophagous Coleoptera obtained by Dr. Loria in New Guinea. Ann. Mus. Civ. Genova (3), i.-xli. 1905, pp. 469-514. [7 new genera, 52 new species.]

129. Redescriptions of some New Species of Phytophagous Coleoptera from Madagascar, collected by E. and B. Perrot, in the Collection of R. Oberthür. Ann. Soc. Ent. Belg. xlix. 1905, pp. 186-190.

130. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Megascelidæ. Wytsman, Genera Ins. No. 32, 1905, 6 pp., 1 pl.

131. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Megalopidæ. Wytsman, Genera Ins. No. 33, 1905, 20 pp., 2 pl. [3 new genera.]

132. Descriptions of New Species of Phytophagous Coleoptera of the genera *Homopheta*, *Asphæra*, and *Edionychis*. Proc. Zool. Soc. London, 1905, ii. (1906), pp. 398-460, pls. xiv-xv. [114 new species.]

133. Descriptions of some New Genera and Species of Phytophagous Coleoptera from New Guinea. Entom. xxxix. 1906, pp. 1-4. [2 new genera, 4 new species.]

134. Description of another New Species of *Æsernia* from New Guinea. Entom. xxxix. 1906, pp. 25-26. [1 new species.]

135. Descriptions of New Genera and Species of African Halticinae and Galerucinae. Trans. Ent. Soc. London, 1906, pp. 11-53, pl. iii. [4 new genera, 59 new species.]

136. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Chrysomelidæ, subfam. Clytrinae. Wytsman, Genera Ins. No. 49, 1906, 87 pp., 5 pl.

Addenda et Corrigenda. *Ibid.*, No. 49 bis, 1907, 1 p.

137. Description of a New Genus and Species of Subfamily

Clytrini from Australia. Entom. xl. 1907, pp. 148. [1 new genus, 1 new species.]

138. Voyage de M. Maurice de Rothschild en Ethiopie et dans l'Afrique orientale [1904-1906]. Espèces nouvelles de Chrysomelidæ. Ann. Soc. Ent. France, lxxvi. [1907] 1908, pp. 515-525. [17 new species.]

139. Descriptions of Two New Genera and Species of Australian Eumolpini (Coleoptera Phytophaga). Entom. xli. 1908, pp. 26-28. [2 new genera, 2 new species.]

140. The Fauna of British India. Coleoptera II. Chrysomelidæ I. London, 1908, 8vo, xxi. 534 pp., 2 pl. [12 new genera, 355 new species.]

141. Descriptions of New Species of South-American Beetles of the Cryptocephaline Division of the Family Chrysomelidæ. Proc. Zool. Soc. London, 1907 (1908), pp. 829-855. [46 new species.]

St. Petersburg.

CURRENT NOTES, 1908.

By G. W. KIRKALDY.

1. RAINBOW, W. J.: "Notes on Mimicry and Variation," Rec. Austral. Mus. vii. 69-73, frontispiece (September 11th). Lepidoptera.
2. DONCASTER, L.: "Animal Parthenogenesis," Sci. Progress, iii. 40-52 (July). Hemiptera; Hymenoptera.
3. HASEMANN, L.: "A Monograph of the North American Psychodidæ," Trans. Amer. Ent. Soc. xxxiii. 299-333, and note, pls. v.-viii. (dated September-November, 1907, but not published till at least January, 1908!). Diptera
4. MITZMAIN, M. B.: "Insect Transmission of Bubonic Plague: a Study of the San Francisco Epidemic," Ent. News, xix. 353-9 (October). Aphaniptera.
5. SWEZEY, O. H.: "Observations on the Life-history of *Chaetogaedia monticola*, Bigot," P. Haw. Ent. Soc. ii. 7-9 (October 15). Diptera.
6. MUIR, F.: "On the Stridulating Organ of a Sphingid from Larat," P. Haw. Ent. Soc. ii. 12-3 (October 15th). Lepidoptera.
7. SWEZEY, O. H.: "On peculiar deviations from Uniformity of Habit among Chalcids and Proctotrupids," P. Haw. Ent. Soc. ii. 18-22 (October 15th). Hymenoptera.
8. KIRKALDY, G. W.: "Some Remarks on the Phylogeny of the Hemiptera-Heteroptera," Canadian Ent. xl. 357-64 (October 2nd).
9. KOLBE, H.: "Mein System der Coleopteren," Zeitschr. Wiss. Insektenbiol. iv. 116-23 (April 30th); 153-62 (June 15th); 219-26 (July 26th). [Not yet finished.]

10. TOWNSEND, C. H. T.: "A Record of Results from Rearings and Dissections of Tachinidæ," Bull. U.S. Ent. (Techn.) 12, pp. 91-118, figs. 25-30 (September 18th). Diptera, &c.
11. BRADLEY, J. C.: "The Evaniidæ, Ensign-Flies, an Archiac (sic!) Family of Hymenoptera," Trans. Amer. Ent. Soc. xxxiv. 101-94, pls. v.-xv. (June, or later).
12. ALDRICH, J. M., and DARLINGTON, P. S.: "The Dipterous Family Helomyzidæ," Trans. Amer. Ent. Soc. xxxiv. 67-100, pls. iii.-iv. (March, or later).
13. DZIURZYNSKI, C.: "Die paläarktischen Arten der Gattung *Zygæna*, F. . . ." Berlin. Ent. Zeitschr., 60 pp. and three plates. Lepidoptera.
14. HOLMGREN, N.: "Über einige myrmecophile Insekten aus Bolivia und Peru," Zool. Anz. xxxiii. 337-49, figs. 1-7 (August 18th). Coleoptera; Hymenoptera.
15. BOCKLET, C.: "Ein gynadromorphes Exemplar von *Epinephele tithonus*, L.," Int. Entom. Zeitschr. ii. 123 and 131 (August 8th and 15th). Lepidoptera.
16. SPEISER, P.: "Die geographische Verbreitung der Diptera pupipara und ihre Phylogenie," Zeitschr. Wiss. Insektenbiol. iv. 241-6 (August 29th; not finished).
17. GEEST, W.: "Untersuchungen über die Wechselbeziehungen zwischen Pigment und Schuppenform und zwischen Zeichnung und anatomischen Verhältnissen des Flügels, dargestellt an der Tagfaltergattung *Colias*, F.," Zeitschr. Wiss. Insektenbiol., iv. 162-9, figs. i.-vi. (June 15th); 208-14, figs. vii.-ix. (July 26th); 251-6, figs. x.-xi. (August 29th). Lepidoptera.
18. KERTÉSZ, C.: "Catalogus Dipterorum," vol. iii. pp. 1-366, and a page of addenda, &c. (1908.)

Rainbow (1) figures some Queensland Lepidoptera, and discusses supposed mimicry. Muir (6) describes briefly the stridulatory apparatus of an Austromalayan Sphingid. Dziurzynski (13) discusses the palæarctic *Zygæna* and their varieties, &c., at some length. Bocklet records (15) a gynandromorphous specimen of *Epinephele tithonus*. Geest (17) discusses the correlations between pigment and the form of the scales, and between pattern and anatomical relations of the wing, based on *Colias*.

Doncaster (2) briefly summarizes what is known on Animal Parthenogenesis, especially in Aphidæ and Cynipidæ.

Hasemann (3) has monographed the North American Pyschodids, while Aldrich and Darlington (12) have discussed the North American species of Helomyzidæ. Speiser (16) has commenced a paper on the geographical distribution and phylogeny of the pupiparous Diptera.

Bradley (11) has contributed a lengthy paper on the Evaniidæ, illustrated by eleven plates.

Kertész (18) has issued the third volume of his general catalogue of Diptera, dealing with the Stratiomyiidae, Erinnidae, Ctenomyiidae, Tabanidae, Pantophthalmidae, and Rhagionidae, totalling 167 genera and 2874 species.

Mitzmain (4) considers the rôle of the flea in the transmission of bubonic plague from rats.

Swezey (5) and Townsend (10) discuss certain points in the biology of Tachinidae; the former also (7) noting certain deviations from usual habit in parasitic Hymenoptera.

Kirkaldy (8) has outlined a new classification of Heteropterous Hemiptera, based on their supposed phylogeny.

Kolbe (9) has commenced a "new system of Coleoptera."

Holmgren (14) describes several new Coleoptera and Hymenoptera, myrmecophiles from the Neotropical Region.

To prevent future confusion, it may be stated here that the "Circulars" of the Division of Entomology of the Hawaiian Sugar Planters' Experiment Station are not "publications." Up to the end of September, 1908, seven have been printed, but are purely private issues, and are not in circulation.

NOTES AND OBSERVATIONS.

LEUCOPHÆA SURINAMENSIS (ORTHOPTERA).—Though interesting to the entomologist, the establishment of a new cockroach with us is looked upon in a different light by the gardener. *L. surinamensis* certainly seems to be spreading somewhat rapidly. It is already a nuisance at Kew Gardens. I have just received a specimen for identification from Mr. G. T. Lyle, which was found crawling about on Christmas Day in a hothouse at Bishopstoke, Hants.—W. J. LUCAS.

ABERRATION OF MALACOSOMA NEUSTRIA.—Referring to the aberration of *Malacosoma neustria* figured in your December number, I have four similar aberrations, all females, bred from ova of a Tiverton (Devon) female in July, 1896.—E. F. STUDD; Oxtou, Exeter, December 26th, 1908.

NOTE ON LYCTUS CAVALICULATUS, F.—I recently had brought under my notice a length of thick lead gas-piping pierced through and through with tiny holes about $1\frac{1}{2}$ mm. in diameter. A piece of Australian "hardwood" along which the pipe had been run was also given me. This showed the presence of small white grubs some 4 mm. to 5 mm. in length. I placed some of the wood in breeding-cages, and in a few weeks there emerged numbers of *Lyctus cavaliculatus*, so well known as a destroyer of wicker furniture. The holes in the lead pipe were cleanly drilled as by a sharp awl; their diameter at the top was slightly greater than at the bottom. The gas-pipe was between the roof and ceiling of a building here in Launceston, and the damage was only discovered when workmen were endeavour-

ing to ascertain the cause of the excessive escape of gas in the house. So far as I am aware this is the first occasion on which the larvæ of this beetle have been recorded as destructive to lead in any form.—FRANK M. LITTLER; Launceston, Tasmania, November 25th, 1908.

MECONEMA VARIUM. — With regard to the remarks of Messrs. Swinton and Lucas on the figure in the 'Entomologist' for 1880, p. 252, I think there is no doubt whatever that it is wrongly named. For many years past I have been in the habit, during the late winter months, of gathering a large number of oak-galls (*A. terminalis*, with a few *C. kollari*) for the purpose of breeding any small moths that had passed the winter therein as larvæ or pupæ. Amongst a great number of insects of various orders I have always bred some *M. varium*, a clear, unspotted, green little creature. When I first bred them I was much puzzled to find that they were quite spotless, when, according to the figure (*loc. cit.*), they should have been spotted! *Leptophyes punctatissima* is spotted from babyhood. That Mr. Bignell bred the species figured I have, of course, no doubt whatever, and, as Mr. Lucas tells us that it is generally found on low growth, those Mr. Bignell bred perhaps emerged from fallen galls. I shall have a day's gall-hunting shortly, and will pick up all the fallen ones I can find, and may perhaps breed *L. punctatissima* therefrom, if it occurs in this neighbourhood. With regard to the Lepidoptera bred, I have not been very successful. The following list comprises the lot:—*Cryptoblabes bistriga* (a single specimen), *Hemimene fimbriana* (scarce, about six or seven only), *Pammene argyrana* (a few), *P. gallicolana* (a large number on two occasions, but very few since), *P. splendidulana* (a few each spring), *Carpocapsa juliana* (two only), *Gelechia luculella* (about half a dozen), *Ecophora sulphurella* (not uncommonly), *Bucculatrix ulmella* (three or four), *Lithocolletis* sp. ? (a single specimen many years ago), *Nepticula subbimaculella* (three only).—A. THURNALL; Thornton Heath, January 6th, 1909.

CHEIMATOBIA BRUMATA.—This troublesome pest has been gradually increasing in numbers during the past few years. Considerable damage was done by the larvæ to fruit trees in some districts in 1907 and 1908, and I fear 1909 may prove a record in this respect. As with *H. defoliaria*, the emergence was delayed by the mild weather. They began to appear at the beginning of November, increased slowly at first, then very rapidly, reaching their greatest numbers at the end of November and first fortnight of December. During that period the woods after dark presented an extraordinary spectacle. The moths were in countless numbers, and many thousands of pairs could be seen every night. I tried to form some idea of the number of *brumata* per acre during early December; it certainly was not less than fifty thousand, and may well have been double that number. I "grease-banded" most of my standard fruit trees; on each of three large apple trees I counted over a thousand females, notwithstanding that many had been brushed off when renewing the grease. In many cases the number of *brumata* caught in the grease-band was so great that they formed a bridge for others to walk over. They have nearly all disappeared, but a few pairs may still be found every evening. (In

1895 I found pairs on March 1st, but I believe that was following a prolonged frost.) A very unfortunate statement appeared in a scientific agricultural paper about twenty-five years ago to the effect that the females were transported by the males when pairing. This statement has been copied over and over again in various agricultural papers, &c., and has deterred many fruit-growers from banding their trees. It is entirely unfounded, the male *brumata* being quite incapable of flying with the female. Grease-banding, when properly carried out, is an effective remedy, the few ova laid below the bands being insufficient to cause harm. I notice that in this district *brumata* flourishes more on the hills than in the valleys; last year and the year before this was very noticeable.—EDWARD GOODWIN, F.E.S.; Canon Court, Watlingbury, Kent, January 14th, 1909.

ON THE EFFECT OF REARING LARVÆ OF VANESSA URTICÆ IN DARKNESS.—The above experiment was carried out in the summer of 1908 on larvæ collected in Huntingdonshire. My object was to ascertain the effect, if any, of breeding a large number of these larvæ from the ovum or very early youth to the commencement of the pupal stage entirely, or almost entirely, in total darkness. The temperature of the breeding-cage was frequently taken, and was that of the outside air. The larvæ were abundantly supplied with food, and they fed up in the same time as others kept under ordinary conditions. They were much darker than ordinary, being almost as black as those of *V. io*, with almost total obliteration of the yellow spiracular line: the pupæ were also extremely dark as was anticipated. Fifty-five butterflies emerged, and twenty-one were noteworthy as having an extension of the black spot on the inner margin towards the second costal spot. In a few cases these two spots were joined by a black line, as in var. *polaris*, but more often by black scales between the two; the ground colour of the wings underwent no change. The proportion of butterflies with this black scaling was far higher than in a large number which as larvæ were given as much sunshine as possible, and others which had their food-plants saturated with water many times a day; the proportion among these was not more than five per cent. I have had no leisure to examine each specimen critically, and this note must be looked on as a preliminary announcement only.—(Lieut.-Col. R.A.M.C.) N. MANDERS; Colombo, Ceylon.

CAPTURES AND FIELD REPORTS.

STENOCEPHALUS AGILIS AND CORIXA AFFINIS (ATOMARIA) IN LANCASHIRE.—I took a single specimen of the former in Liverpool (July) and of the latter at Birkdale in May last. These are, I believe, the first specimens recorded for this county.—OSCAR WHITTAKER; 13, Lancaster Road, Birkdale, December 22nd, 1908.

THYPHLOCYBA DEBILIS, Dougl., IN LANCASHIRE.—I took a specimen of this rare species on dwarf willow here in July last year.—OSCAR WHITTAKER.

PYRAMEIS IN JANUARY.—I saw a fresh-looking specimen of *Pyrameis atalanta* flying in the sunshine in a sheltered hollow at Brook, Isle of Wight, on January 7th last.—ORFORD YOUNG, M.D.; Yarmouth, Isle of Wight, January 10th, 1909.

EARLY APPEARANCE OF HYBERNIA RUPICAPRARIA.—On 4th inst. several male specimens of this species were at rest on an electric illuminated window here.—HERBERT W. BAKER; 73, Limetree Place, Stowmarket, Suffolk, January 6th, 1909.

Erratum.—In January number, page 18, line 16 from bottom, for "December 12th" read "December 17th."

TÆNIOCAMPA GOTHICA IN JUNE AND OCTOBER.—I should like to record having taken a somewhat worn specimen of *T. gothica* on the flowers of *Buddleia globosa* on June 12th, 1908, and a very perfect specimen at ivy bloom on October 15th. I also captured a good specimen of *Acronycta psi* at sugar on the evening of September 6th.—(Miss) B. CONEY; Pucklechurch, Glos.

PIERIS NAPI, var.—Last May I had a very large number of *brassicæ*, *rapæ*, and *napi*, and among the more or less interesting forms that appeared were a fine male *napi* with the basal portion of all fore wings conspicuously black. Mr. Raynor—who was here yesterday—strongly urged me to send you a note of its occurrence, and thought it deserved a varietal name, so we decided to call it *basinigra*. A similar but somewhat more pronounced form of *brassicæ* is figured in Morris's 'British Butterflies,' having been copied from 'The Zoologist,' p. 471. It was taken in a garden in Leicester in 1843. I have always been on the look-out for this form, but though I have bred and captured many thousands of specimens, I never met with anything approaching it previously.—W. H. HARWOOD; 94, Station Road, Colchester, September 4th, 1908.

PTEROPHORUS MONODACTYLUS IN JANUARY.—On Esher Common, January 2nd, I observed *Pterophorus monodactylus*; first, at rest about two feet from the ground on oak palings above dead leaves and behind brambles, and later on, high up on the trunk of a Scotch fir. This capture may serve to confirm the belief that this moth hibernates during the winter months, flying only at times in favourable weather.—D. C. HOLMES; The Briars, Manor Road, Thames Ditton, January 4th, 1909.

[This species most certainly passes the winter in the moth state, but, except perhaps during the coldest weather, it does not seem to become absolutely dormant. It is often seen among the latest insect visitors to ivy bloom and the earliest to the willow catkins.—ED.]

HYBERNIA LEUCOPHÆARIA ON JANUARY 8TH.—On the oak-fence of Esher Common I took to-day a male *H. leucophæaria*. It was a dark nicely banded specimen, and seems worthy of record, the date being so very early.—D. C. HOLMES.

CAMPODEA STAPHYLINUS (APTERA).—In rotting stumps from which trees have been cut down, I found to-day (January 8th, 1909) several

specimens of this very simple insect, this being, I think, the first time I have noticed it during the winter months. With it was a small centipede of the order Symphyla, and apparently of the genus *Scolopendrella*, which resembles it so closely as to give one the idea that there may be a connection here between the Myriapoda and Insecta—an opinion which has of course been put forward.—W. J. LUCAS.

SPHINX CONVULVULI IN WILTSHIRE, 1908.—I omitted to record during November that I had two very fine specimens of *S. convolvuli* brought me, one taken in Salisbury city, the other in the village of Broadchalke, a few miles out. They are male and female, both perfect. The female was taken in mid-October, the male in early November.—W. A. BOGUE; Sunnybrae, Kirtleton Avenue, Weymouth, December 27th, 1908.

PERIPLANETA AUSTRALASIE IN CORNWALL.—In May, 1906, I took a fine specimen of this cockroach at Truro. I have only recently identified same whilst reading the 'Entomologist,' vol. xxix. p. 124, with an excellent drawing of same on p. 97, both pages indicating the distinct differences between this species and *P. americana*. The note referred to above is by Mr. W. J. Lucas, who indicates that this insect is not a common one; I have therefore thought it might be of interest to send my record.—W. A. ROLLASON; Lamorna, Truro, Cornwall, January 4th, 1909.

PHIGALIA PEDARIA.—Although this species is most often seen during the first three months of the year, chiefly in February, odd specimens have been noted in November and December. This seems to have been the case last year, as Mr. B. Weddell, of Selkirk, informs us that a living male specimen was brought to him on November 2nd. Another example is reported from Haslemere, taken on a street lamp, November 28th; and a male was taken, also on a gas-lamp, at Weymouth, on December 21st.

HYBERNIA DEFOLIARIA.—Having noticed an unusual number of the larvæ of this species last summer, I was not surprised to find the insects plentiful this winter. They commenced to emerge early in October, but, owing to the exceptionally mild weather, they appeared very slowly, and it was not till the end of November that they were well out. From that time until the beginning of January the males were very common, but I came across very few females. The year closed with a few days' frost and snow, quickly followed by a return of mild weather. On January 2nd I found a number of males and females emerging, principally the latter, and I noticed during the evening seventy or eighty pairs. Since then they have depreciated both in number and quality, but even at this date (January 14th) a few are quite fresh. I must have examined some thousands of males, but I found very few exceptional varieties.—EDWARD GOODWIN, F.E.S.; Canon Court, Watlingbury, Kent.

CAPTURES AT LIGHT IN THE CHESTER DISTRICT.—The following captures have been effected at the Chester and district electric lamps

since November, 1907:—*Cerura bifida* (4), *Zeuzera æsculi* (1), *Sphinx convolvuli* (2), *Acherontia atropos* (3), *Petasia cassinea* (3), *Tænio-campa gracilis* (1), *Pheosia dictæoides* (1), *Agrotis suffusa* (5), *Dasy-polia templi* (1, fourth recorded example since 1907), *Himera pennaria* (5).—ALFRED NEWSTEAD; Grosvenor Museum, Chester.

NOTES FROM MESSINA.—I reached here on the 9th November last; temperature 73° in the shade, which later on fell to 67°, at which it now stands. During the last few days rain has fallen heavily, but without lessening the heat. The butterflies on the hills near the town are nearly all such as are found (sometimes only occasionally) in England. The common butterflies here are *Pieris rapæ* (this occurs in centre of town) and *P. brassicæ*; and I captured a fine specimen of *P. daplidice* (November 19th). *Colias edusa* flies about rapidly on the hill-sides; I have only taken males. *Pararge megæra* is common near the torrent-beds. *P. egeria* (one), the local form. *Chrysophanus phlæas*, on the hill-sides. *Pyrameis atalanta*, this is the commonest of the Vanessidæ here, and occurs in gardens, roads, &c. *P. cardui*, a few; but strange to say I have not seen either *urticæ* or *io*. This comprises the list of butterflies I have noticed in mid-November, just a dozen species in all. Moths are scarce; three small species taken. Grasshoppers abound, also a few locusts and beetles. I watched a lizard pounce upon a good-sized grasshopper; it tried to get away into a hole in the wall and slipped down two or three feet, but stuck fast to its prey and then disappeared. Caterpillars are not much in evidence. I noticed some on heath (a species of) on Monte Ciccio, and left them to grow bigger. I think they may belong to a species allied to *Lasiocampa quercus*. During the winter I am not expecting many other species of butterfly to turn up, but shall look forward to the spring.—J. PLATT-BARRETT.

[The writer of the above, who is probably known, at least by name, to most of our readers, was residing in Messina at the time of the recent earthquake (Dec. 28th). He fortunately escaped, together with his son; but the wife and daughter of the latter were among the victims of that lamentable occurrence.—ED.]

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—At the Annual Meeting of this Society, held at 11, Chandos Street, Cavendish Square, on the evening of Wednesday, January 20th, the following Officers and Council were elected for the Session 1909-10:—President, Dr. F. A. Dixey, M.A., M.D.; Treasurer, Mr. A. H. Jones; Librarian, Mr. G. C. Champion, F.Z.S.; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander J. J. Walker, M.A., R.N.; other members of the Council, Dr. T. A. Chapman, M.D., F.Z.S.; Mr. A. Harrison, F.L.S., F.C.S.; Mr. Selwyn Image, M.A.; Dr. K. Jordan, Ph.D.; Dr. G. B. Longstaff, M.D.; Mr. H. Main, B.Sc.; Mr. G. A. K. Marshall; Professor E. B. Poulton, D.Sc., M.A., F.R.S.; Mr. R. Shelford, M.A.;

Mr. Rowland E. Turner; Mr. J. W. Tutt, and Mr. C. O. Waterhouse. The outgoing President, Mr. C. O. Waterhouse, having alluded to the loss the Society had sustained in the death of seven Fellows, took as the subject of his address, "The Claws of Insects." After briefly describing the various forms of insects' claws which are classified as toothed, appendiculate, bifid, or pectinate; and having given examples of each, he suggested as a subject for investigation, which he hoped entomologists would take up as a study, "Are these forms of claw merely the result of heredity without any special object, or is there evidence to show that the different forms are adapted to different modes of life; in fact, have been developed to meet special needs?" He then proceeded to show, by numerous examples, that closely allied species often had dissimilar claws; that insects with quite different habits had the same form of claw; and that others with different forms of claw seemed to have the same habits. The question therefore appeared to be still an open one, requiring careful investigation, and he appealed for more field observation with a view to solve this and many other problems.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Nov. 26th, 1908.—Mr. A. Sich, F.E.S., President, in the chair: The Annual Exhibition of Varieties.—Mr. Adlard, Bartholomew Close, E.C., was elected a member.—Mr. South exhibited series of *Cirrhædia vaccinii* and *C. ligula* from the Continent, and discussed at length the various forms and named varieties, comparing them with British examples. He also showed the *Cucullia* species previously shown, stating that upon examination of the genitalia by Mr. Pierce, three of the Continental males were shown to be *C. lychnitis* and two *C. verbasci*, and one bred from a larva found feeding on *Scrophularia nodosa* in North Kent proved to be *C. verbasci* also.—Messrs. Harrison and Main, an extensive bred series of *Aplecta nebulosa*, with a large proportion of var. *robsoni* and var. *thompsoni*, and gave notes and statistics of the results. They also showed a bred gynandrous specimen of *Pieris napi*, left side male, right side female.—Mr. R. Adkin, series of *Boarmia gemmaria* (*rhomboïdaria*), comprising typical and black forms reared from wild ova in 1907, and a portion of Edward Newman's series of the same species and of var. *perfumaria*, and discussed the last-named form. He also showed *Anthrocera achilleæ* from Argyllshire, *Nola albulalis* from East Sussex, 1908, a variety of *Chrysophanus phlæas* of a coppery shade with the red band reduced to narrow bars, an example of *Aglais urticae* with very large blue lunules and tips of fore wings streaked with pale blue-grey, together with a case containing pupa-skins *in situ* of several of the rarer Sesiidæ, resinous nodules with cocoons of *Retinea resinella*, one of which had been appropriated by a larva of *Dioryctria abietella*, cocoons of *Nola centonalis* and of *Hylophila bicolorana*; also *Zenillia roseanae*, a dipterous parasite on the larvæ of *Tortrix pronubana*, new to Britain.—Mr. G. T. Porritt, varieties of *Abraxas grossulariata* bred from wild larvæ of this year, including an ab. *varleyata* male, in which there was a double row of white rays on the hind wings.—Mr. Newman, a long series of *Grapta c-album* and

var. *hutchinsoni* bred from ova, and read full notes on the life-history. He also showed hand-paintings of the finest varieties bred and captured by him during the season, and an almost perfectly black extreme form of *A. grossulariata*, the under wings alone showing slight traces of white.—Mr. W. Crocker, *Phryxus livornica*, from Torquay, May, 1906, a fawn-coloured *Gnophos obscuraria* from Babbacombe, a very varied series of *Hesperia malvæ* var. *taras*, *Leucania extranea*, taken at sallow in April, 1906, and varieties of *Melitæa athalia* and *M. aurinia*.—Mr. Hy. J. Turner, extremes in size of *Polyommatus damon* from the Alps; a number of species of the genus *Brenthis*, in which the submarginal spots and lunules were more or less coalescent; a nice series of *Satyrus cordula* from Vissoye, with female var. *pæas*; and a box containing numerous species of Rhopalocera from German East Africa and from Biké in Central Africa.—Mr. Lucas, the large earwig *Labidura riparia*, which he had kept alive for some months, feeding it on fish.—Mr. Tonge, *Sirex noctilio*, taken in his house at Reigate.—Mr. Edelsten, a long series of the new British species *Nonagria neurica* from Sussex, with Continental examples; and series from various localities of *N. dissoluta* and var. *arundineta*.—Mr. Joy, an unusually pale example of *Argynnis paphia*.—Mr. Ashdown, a long series of the Longicorn, *Strangalia armata*, to show the range of variation in the markings.—Mr. H. W. Andrews, examples of the British species of Eristalinae, and read notes on the mimetic resemblances shown.—Mr. Baldock, a number of species of *Ornithoptera*, including the rare *O. miranda* and *O. andromache*.—Mr. Gibbs, a long and very variable series of *Argynnis adippe*, captured in the Vosges Mountains this season, including fine examples of var. *cleodoxa*, and some very brilliant undersides.—Mr. T. W. Hall, a drawer of hybrid Lepidoptera, including *Smerinthus ocellatus* × *populi*, *Notodonta ziczac* × *dromedarius*, *Selenia tetralunaria* × *bilunaria*, and *Ennomos erosaria* × *fuscantaria*.—Dr. Hodgson, a selected series of *Plebeius argus* (*egon*) from various localities.—Mr. Step, about fifty photographs of fungi found in 1908.—Rev. E. Tarbat, a box containing examples of forty-one species of Lepidoptera taken at Fareham, settling on a white wall in the full glare of a strong electric light, including *Stauropus fagi*, *Epunda nigra*, *Luperina cespitis*, *Nonagria typhæ*, &c. He also showed a *Melitæa aurinia* with unusually small spotting; a *Tæniocampa gothica*, with the "character" reduced to two small spots; and a *Malacosoma neustria* with a very broad, uniformly wide band across the fore wings.—Mr. West (Greenwich), his collection of British Homoptera, including a series of *Idiocerus rutilans*, a species new to Britain, and a specialised series of the innumerable forms of *Philenus spumarius*.—Mr. W. Lucas, a large number of photographs illustrating the life-histories of the denizens of the Scotch fir.—Mr. Pennington, a box of varieties of British Lepidoptera, including var. *fowleri* of *Agriades corydon*.—Mr. Stanley Edwards, several species of exotic *Papilio*, among them being *P. domasepe*, *P. telearchus*, *P. slateri*, *P. cannus*, &c., which mimic different species of Danaine butterflies.—Rev. W. Wheeler, a case containing the species and forms of *Apatura* obtainable from the Alps; a case of the closely allied species and forms of the *athalia* group of the genus *Melitæa*; and a case of the smaller

European species of the genus *Erebia*, including *E. christi*.—Mr. J. P. Barrett a communication from Sicily, noting some twelve species of Rhopalocera which he had met with near Messina in mid-winter, including *C. edusa*, *Pararge megæra*, *P. egeria*, *Heodes phlæas*, *Pieris daphidice*, &c.—HY. J. TURNER, *Hon. Rep. Sec.*

A CORRECTION: An obvious mistake was made in the report of October 22nd, when "sallow" was given as the food-plant of *Limenitis sibylla*, instead of "honeysuckle."

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—November 18th.—Mr. H. M. Edelsten exhibited *Nonagria neurica* (Hubn.) from Sussex, new to the British list; also *N. dissoluta* and var. *arundineta* from various localities. — Mr. G. H. Heath, *Thyatira batis* with pink coloration in spots replaced by brown, and *Miana strigilis* with red central fascia and white marginal band, both from Ashford, Kent, 1908.—Dr. G. G. C. Hodgson, *Zygænidæ* from one Surrey locality, mainly *Z. trifolii* and *Z. hippocrepidis*, including several melanic examples of the former, two apparent *trifolii* with a sixth spot, and an apparent *hippocrepidis* with right-hand wings resembling *minos*.—Mr. L. W. Newman, a long series of *Vanessa c-album*, including a few specimens with the c transformed into a d. —Mr. V. E. Shaw, a series of *Lycæna ægon*, Eynsford, July, 1908, including female with coloration approaching to that of the male.—Mr. P. H. Tautz, a bred series of *Amphidasys betularia* and var. *doubledayaria* bred from *doubledayaria* female taken at Wicken.—Mr. L. W. Newman read some interesting notes on observations made while breeding *Vanessa c-album*, and recorded the following as facts observed by him: (a) The first ten or fifteen ova laid by female in spring produce var. *hutchinsoni*. (b) The remainder of the ova laid by female in spring produce the typical form. (c) The *hutchinsoni* imagines emerge first, pair, and lay the ova which produce the autumn brood. (d) The typical imagines emerge later, refuse to pair, either *inter se* or with *hutchinsoni*, and go into hibernation early in the summer. (e) So far as specimens in captivity are concerned, this attempt at hibernation does not succeed, the imagines dying during the winter or early spring.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

The Moths of the British Isles. By R. SOUTH, F.E.S., &c. Series II. ("Wayside and Woodland Series"), pp. 376, pl. 159 (96 with 873 figures coloured) and 20 figures in text. London: F. Warne & Co. 7s. 6d. net. 1908.

THIS volume maintains the excellence we noted in regard to Series I. (Entom. 1908, p. 23), and comes out very promptly after it. It completes the view of the species usually described as "Macros," excepting the Psychids. These are not more entitled to be "Micros" than several families towards the end of the volume.

The outstanding feature, as of the previous volumes, is the repre-

sentation of all the species dealt with by colour photography, chiefly from the actual specimens. The merits of these plates it would be difficult to exaggerate, although two or three seem a little out of focus, and in one the colours have escaped exact superposition.

The *Plusias* may perhaps be selected for special notice. Whether anyone who had never seen a *Plusia* would realize from the plates that certain portions of the wings shine metallically may be difficult to decide, but those who cannot place themselves in that untutored attitude will see almost the insects themselves, with their silver, bronze, or gold markings. Those from drawings by Mr. Knight, *e. g.* the frontispiece (Pl. 1), leave nothing to be desired; between these, however, and those photographed directly from the insect there is the difference that here every blemish in the specimen is eliminated, whilst in the others every injury and defect is faithfully recorded, as, for example, one sees that the specimen of *P. bractea* was not in so fine condition as some of the others. This, from our point of view, so far from being a blemish, is an unquestionable certificate of truthfulness to nature, since it shows the specimen as it is, and not as we or the artist, possibly erroneously, may think it ought to be.

One might have liked more of the admirable photographs in the text by Mr. Lucas and Mr. Main, altogether twenty or twenty-four, if we include those on the covers, as they illustrate, by what are often beautiful pictures, interesting points, such as natural attitudes, means of concealment, &c.

It would perhaps be unkind to enlarge again on our objections to the unfortunate adoption of English names. Not perhaps always unfortunate, as who can help failing to find some amusement in such names as "The Silver Hook," "The Dark Spinach," "The Slender-striped Rufous," or "The Brussels Lace"?

The plain plates of earlier stages are somewhat unequal, some very good, some less so—all useful to give the beginner some idea of the egg, larva, or pupa of the particular species, or of the group to which it belongs.

Perhaps we ought to note that the latest addition to the British Macros, *Z. achilleæ*, is figured and noticed, as well as the new and interesting dark var. of *E. autumnaria* just discovered by Mr. L. W. Newman; so that the work is quite up to date.

We notice few errata; that in the legend on Pl. 77 is obvious, and will mislead no one. The reference to the early stages of *E. autumnaria* is erroneous both in text and index.

We have looked for as many faults as possible, possibly from envy that such an excellent and complete guide, at so low a price, affords the tyro such help as was not to be obtained in our early days, even from an expensive library—an assistance that will last him until he begins to specialize in some direction or other. Probably it is necessary, now that entomology affords so many wide fields for study, that the early stages should be made so easy, and capable, therefore, of being rapidly mastered.

Such samplings of the text as we have made show Mr. South to have that command of his subject with which we all credit him, and

probably one might read from cover to cover without finding any errors.

There is apparently not to be a further volume of "Micros," and when the young entomologist begins the "Micros" he will presumably want something more advanced than the present work affords. This is perhaps doubtful, but if he asks us where he is to get it, we cannot tell him. There is surely room now for a work on our smaller moths, with illustrations of the imagoes similar to those Mr. South gives us, and photographs of their mines, cases, &c., and with distinct, if brief, notes on their life-history—a book useful not only to the tyro but also to the advanced student; if it could cater for both without seriously disappointing either it ought to be successful commercially also.

T. A. C.

The Evaniidæ, Ensign-Flies; an Archaic Family of Hymenoptera.

By J. CHESTER BRADLEY. ('Transactions' of the American Entomological Society, 1908, pp. 101–194 and pls. v.–xv.)

THIS is a most valuable contribution to our knowledge of this aberrant and somewhat heterogeneous family of the Parasitica. The author begins with a short consideration of its general features, tabulates the world's genera of the subfamily Aulacinae, treats briefly of the Fœninæ and at more length of the Evaniinæ, concluding with a catalogue of the world's species of this third division. To British students (if there be such!) the most interesting point is the restoration of the generic term *Fœnus*, adopted by Marshall in his British Catalogue of 1874, but which has ever since given place upon the Continent to the *nomen nudum*, *Gasteruption*, Latreille. Our indigenous species are sadly in need of revision—a very simple matter since but seven were known in 1874, and only one (*Fœnus minutus*, Tourn.) has since been added (cf. Entom. xiii. p. 89). Of these, *Trigonalys* is said by Mr. Bradley not to belong to the Evaniidæ at all, and modern Continental authors have extended their *penchant* for "unrecognizable species" (whether the type be extant or not) to *Fœnus jaculator*, Linn. Mr. Bradley's plates are excellent, and are mainly reproduced from photomicrographs.

C. M.

Report of the Entomologic Field Station conducted at Old Forge, N.Y., in the Summer of 1905. By J. G. NEEDHAM. Albany, 1908. Pp. 156–263, 29 plates, 29 figures and maps in the text.

IN this report we have a most interesting and useful account of work undertaken for the study of aquatic insects in their relation to the food of fishes. Method of work, mayflies, dragonflies, and crane-flies are the subjects dealt with. There is in addition a paper by O. S. Thompson on the "Appendages of the Second Abdominal Segment of Male Dragonflies."

W. J. L.

OBITUARY.

JOHN ADOLPHUS CLARK, M.P.S., L.D.S. Eng., F.E.S., &c., died at his residence, Weston Park, Crouch End, N., on the 16th inst., from an attack of angina pectoris. For several years past he had suffered from a slight heart trouble, and this was severely aggravated by a dastardly attack made upon him by a street thief in an attempt to rob him. He was born in Aldermanbury, in the City of London, November 15th, 1842, and in his younger days resided with his parents at Homerton, and here first evinced his taste for entomology at the early age of six years, the neighbouring and extensive Lea Marshes being then a very rich collecting ground for the entomologist. After serving a time as assistant to a medical practitioner (the late Dr. Kibbler), he established himself in the chemist and druggist business in the Broadway, London Fields, which he successfully carried on for many years until he retired to private life, about twelve years since, and took up his residence at Crouch End, where his Friday "At Homes" for some years past have given his numerous friends most enjoyable opportunities of inspecting his magnificent collection of British Lepidoptera and other natural history treasures, and hearing much of interest concerning them from their most genial host. Although possessed of a vast store of knowledge of the earlier stages, habits, and variations of our indigenous Macro- and Micro-Lepidoptera, he seldom published anything relating to them; his "Revision of *Peronea cristana* and its Varieties" (of which he possessed an enormous and unrivalled series), which appeared in the 'Entomologist's Record,' vol. xiii., is perhaps the best known and most important of his contributions to entomological literature. For the several past years he was preparing a similar revision of the named varieties of *Sarothripa revayana* and *Teras literana*, both of which, unfortunately, remain incomplete. His very extensive collection of British Lepidoptera, equally rich in both macros and micros, and occupying over two hundred drawers, is remarkable for the large number of superb varieties and aberrations, the fine bred series of most of the species, the very perfect state of preservation, and careful and uniform setting. We believe the whole will be shortly offered for sale.

Apart from entomology, he was an enthusiastic collector of birds, and was often out with his gun on the Lea Marshes by 4 a.m. until time to return for business, and his collection, preserved and mounted by himself, includes many rarities and interesting varieties.

He was elected a Fellow of the Entomological Society of London in 1886, and was one of the founders of the old Haggerstone Entomological Society, established in 1858, and now known as the City of London Entomological and Natural History Society, remaining an active member and officer until the last.

He was twice married, his second wife, to whom he was married in 1904, and his three daughters surviving him.

O. E. J.



ARGYNNIS LAODICE

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LIFE-HISTORY OF *ARGYNNIS LAODICE*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

(PLATE II.)

On September 17th, 1907, I received from the Hon. N. Charles Rothschild a number of eggs of *Argynnis laodice*, obtained from four females captured by himself near Cséhtelek, in the Bihar Comitat, Hungary. The four specimens were placed on potted-up plants of dog-violet (*Viola canina*), with the satisfactory result that about one hundred and seventy eggs were deposited on various parts of the leaves and stems. By acquiring this consignment of ova I have been enabled, through Mr. Rothschild's kindness, to have the pleasure of successfully working out the complete life-history of this rare species, which I believe has never been previously accomplished, and, excepting the full-grown larva and pupa that were described and figured twenty-six years ago by G. Künow ('Schriften d. Physik, Oekon Geselbech, zu Königsberg,' vol. xiii. p. 147, 1872), nothing hitherto was known of any of the earlier stages.

Aigner has already recorded ('Rovartani Lapok,' vol. xiv. p. 222, 1907) the capture of the specimens of this *Argynnis* by Mr. Rothschild.

This species, which apparently only occurs in the Réz Mountains and not on the plain, frequents open spaces in the forest in the neighbourhood of streams, where it flies in company with *A. paphia*, *A. adippe*, and *A. lathonia*, frequenting the blossoms of bramble and of hemp-agrimony. All the specimens that Mr. Rothschild secured were worn, being taken from about the middle of August onwards, and were mostly females. Apparently the locality where these were captured is the most western point in Hungary, and possibly in Europe, at which this species has been observed.

The egg resembles that of *Argynnis adippe* in shape and general structure, but in the number of keels it is more similar to *A. aglaia*. It is conical in form but rather straight-sided, and $\frac{3}{32}$ in. in height; the base is twice the width of the crown, which

is sunken, the micropyle finely reticulated. There are about twenty strongly developed longitudinal keels, eight of which run the entire length, starting at the edge of the micropyle, where they rise high above the surface; others start about one-fourth down, and run to the base, which is flattened; the intervening spaces, which are deeply concaved, are transversely ribbed by about fifteen in number; the surface is finely pitted.

Mr. Rothschild informs me, when first laid, the eggs are "a very pale straw-colour, but get gradually darker." This is the case with all the *Argynnidæ* eggs. When they first reached me some had already assumed two purplish zones, one at the crown, the other near the base; these gradually darken to a deep purplish hue, especially near the crown, the basal one being much paler. The rest of the egg is an olive ochreous colour, excepting the extreme summit, which is transparent; the colouring changes with the maturing of the larva, which is apparently well-developed by the beginning of October, when the above description was made.

During winter the egg appears to deepen somewhat in colour, and assuming a generally rather deeper purplish drab before hatching.

On examining the eggs February 19th, 1908, I found some had just hatched, and others on the point of hatching.

The larva eats its way out by making a large hole in the side of the shell. Directly after emergence it measures $\frac{1}{20}$ in. long. It very closely resembles *A. paphia* in structure. The head is shining olive-black, beset with pale ochreous, finely serrated bristles; on the first segment is a dark dorsal disc, each segment bears a series of large warts, on the summit of each rises a long, finely serrated, club-tipped ochreous brown bristle, with a shining black and brown bulbous base; the dorsal series of bristles are in pairs, both situated on a large wart on each segment; the other two large globular subdorsal warts have each a single hair. There are in all eight hairs and six warts on each segment above the spiracles; below each of the latter is a large globose wart bearing five long, fine serrated hairs projecting laterally; excepting on the last three segments, all the dorsal hairs curve forwards, while those on these last segments are straighter and project backwards; on the ventral surface, claspers, and legs are simple, white, finely-pointed bristles. The entire body (including the legs and claspers) is a pale olive-ochreous colour, densely covered with extremely fine black points, producing a very fine granulated surface. The colouring gradually becomes slightly darker when a day or two old, and the large body-warts assume an olive-green-grey hue.

When touched they fall and roll up, remaining so for many minutes.

The young larva exactly resembles that of *A. paphia* in

structure, having the hairs and warts of similar number and formation.

Owing to dull, sunless weather for about a week from the time of hatching the little larvæ remained inactive, and it was several days before I could detect that they had fed at all, and then they fed only on the cuticle of the more tender parts of the shoots and young leaves of violet (*Viola canina*). They are very sluggish in movement, and only show signs of activity during sunshine.

When a month old, *i. e.* on March 19th, the larva only measured $\frac{1}{3}$ in. long; it is then more uniformly darker in colour, being of a light olive-brown. They now feed along the edges of the young leaves, eating the entire substance.

On April 1st some prepared for first moult, when they measure $\frac{1}{3}$ in. long. The colour is pale ochreous, mottled with purplish brown, chiefly arranged so as to form longitudinal bands, excepting along the dorsal surface, where they are V-shaped on each segment, with a very fine medio-dorsal line running through the V-markings.

First moult took place on April 3rd.

After first moult, sixty-five days old, it measures $\frac{3}{16}$ in. long. There are six longitudinal rows of dusky tubercles with ochreous bases, each bearing several finely serrated bristles, the largest ones having the apex slightly knobbed; each tubercle terminates with the longest bristle. The head is shining black, and beset with bristles; the ground colour is very pale ochreous, streaked and chequered with purplish brown, with a fine medio-dorsal line of the same colour, and a dark dorsal blotch on each side of it, on the anterior part of each segment; a dark spiracular band borders a conspicuous whitish lateral stripe, including the lateral series of tubercles; the under surface, claspers, and legs are also ochreous and chequered with brown.

On April 25th one moulted the second time.

After second moult, eighty-six days old, the larva is $\frac{1}{4}$ in. long. The tubercles are all pale ochreous, and all the dark markings are outlined with whitish; the medio-dorsal line is bordered on either side by a fine white line; the lateral lobes form a whitish band. After feeding they usually crawl down the stems, upon which they rest.

Several moulted third time the middle of May.

After third moult, ninety-four days old, it measures $\frac{1}{2}$ in. long; it is similar to the previous stage, but all the markings are clearly defined. The dorsal tubercles are cream-coloured, those on the first two segments are coppery; the subdorsal and lateral tubercles whitish; legs ochreous; head ochreous, mottled with brown; eye-spots black.

Just before fourth moult it measures $\frac{9}{16}$ in. On May 23rd I noticed two had moulted fourth time.

After fourth moult, one hundred and eleven days old, it is

$\frac{5}{8}$ in. long. Similar to previous stage, excepting the tubercles, which are of a delicate lilac-pink, bearing black bristles; head and legs ochreous, former speckled with brown, and a central V-shaped mark and black eye-spots. During the greater part of the day they rest at the base of the plant and under the leaves; towards evening they ascend the leaves to feed.

After fifth and last moult, fully grown, it measures about $1\frac{1}{2}$ in. long. The body slightly tapers at each end. There are in all sixty-two rather long tubercles (spines), four on the first segment, two on the second, four on the third and twelfth; on all the remaining segments, fourth to eleventh inclusive, have each six spines; these run in longitudinal rows, being dorsal, subdorsal, and lateral; the first pair on the anterior segment are slightly longer than the rest, and project over the head, but curve gently backwards; the second and third pairs are only slightly curved; all the other spines are straight. All bear numerous black, shining bristles, and each terminates with the same. The outline of all the spines is undulating, the space between each bristle being convex; most of the spines are of a semi-transparent, pearly, milk-white colour, with the bases more or less lilac-pink; those on the first segment are wholly rose-pink, and the succeeding ones gradually become paler, while those on the anal segment are likewise rose-pink; all have dull rose or lilac-pink bases. The general ground colour of the body is olive-brown, being composed of a cream-coloured ground, finely mottled with dull black, forming an irregular chequered pattern; the ventral surface is much darker, mostly of a deep olive-brown; there is a medio-dorsal cream-coloured longitudinal stripe, divided by a fine blackish line; on each segment bordering the stripe is a conspicuous, bold, velvety-black mark, divided in the centre by the dorsal spine; the anterior portion is quadrangular and posterior half triangular; a slightly oblique elongated mark below and behind each dorsal spine excepting the first; along the side is a subdorsal series of dusky markings, bordered on each side by a cream-coloured line forming a wavy band, broken up by the subdorsal spines; below each of these spines, surrounding the spiracles, are bold black mottlings; the subspiracular spines are situated on the dilated lateral undulating ridge, which is dull milky white. The head is flesh-colour, freckled with brown; eye-spots black; a rose-coloured spot on each side of the crown, which is brown in front, with a central Λ -shaped whitish mark outlining the head-pieces. The legs are coloured like the head; the claspers are rich red-brown. The anal segment terminates in a conical point of a rust-reddish colour; on the ventral surface of this segment are warty eminences clustered with black bristles, as well as on the anal point; the head and claspers are all bristle-bearing.

Künow's figure of the enlargement of the segment does not

accurately portray the structure or markings of this larva; he represents the spines as straight-edged, and the bristles much too small, and the colouring of the spines of the sixth segment, which he figures as being wholly pink, are in all the larvæ in my possession as I have described. He neither shows the second dorsal slightly oblique mark, nor the subdorsal markings forming a band. In his figure of the larva there is wanting much detail of markings; the first and last spines are much too short, and represented as being quite straight, which should be longest and curved on the anterior segment, and they are all too dull in colour.

On June 22nd the first larva attached itself by its hind claspers to a pad of silk spun on the gauze cover, and pupated on the 24th. Just after pupation it is mostly of a brownish-pink colour, which gradually deepens into a shining bronze-black, with a few ochreous-brown speckles appearing on the abdomen. The metallic spots of the mature pupa are at first exactly similar to mother-of-pearl.

The pupa averages in length $\frac{13}{16}$ in.; it so closely resembles *A. paphia* in structure and markings that they are almost indistinguishable, and as regards colouring *A. laodice* and the dark forms of *A. paphia* are exactly alike. The only slight difference between the two species is that in *paphia* the subdorsal angular projections on the third abdominal segment are rather larger than those of *laodice*, and when viewed dorsally *paphia* is rather wider across the base of the wings.

A. laodice pupa, dorsal view: Head with two pointed lateral horns, a similar but smaller angular point at base of wings; continued along the base is a convex ridge, then concave across the middle, and bulging at hind margin; abdomen attenuated to anal extremity. Side view: Head beaked, thorax keeled and angular, sunken at base of abdomen and metathorax; abdomen curving to anal segment, which terminates in a truncated projection bearing the cremastral hooks; ventral surface of abdomen contracted; wings bulging near apex; antennæ serrated; leg-joints prominent.

Colouring: Ground colour pale buff-brown, inclining to pinkish over the head and thorax; there are two subdorsal rows of sharply pointed conical projections commencing on the prothorax; the first five pairs are of a beautiful metallic silver-gilt; these are placed on the three thoracic segments and the first two abdominal segments; the remaining pairs are without metallic lustre, being shining variegated brown; those on the third segment are largest, and those on the ninth are very minute; on the fifth, sixth, and seventh segments are very small medio-dorsal points. The whole surface is very finely reticulated with dark brown, forming a delicate fibrous pattern; across the wing are two wavy brown bands, exactly similar to *paphia*; the dark spiracles are

placed on a dusky stripe, and the ventral abdominal surface is indistinctly striped.

Künow says a striking point about this pupa is the extreme prominence of the feet and feelers. I do not, however, find any striking difference from that of *A. paphia* in either the legs or antennæ.

EXPLANATION OF PLATE:—Fig. 1. Egg, drawn 4/10/1907. Fig. 2. Seventh segment of larva directly after emergence, drawn 20/2/1908. Fig. 3. Larva, first-stage, 27 days old, drawn 18/3/1908. Fig. 4. Larva, 21 days after 1st moult, 65 days old, drawn 24/4/1908. Fig. 5. Larva, after 2nd moult, 86 days old, drawn 15/5/1908. Fig. 6. Larva, after 3rd moult, 94 days old, drawn 23/5/1908. Fig. 7. Larva, after 4th moult, 111 days old, drawn 9/6/1908. Fig. 8. Larva, after 5th moult, fully grown, 124 days old, drawn 22/6/1908. Fig. 9. Larva, after 5th moult, fully-grown, seventh segment, drawn 23/6/1908. Fig. 10. Pupa, five days old, light-form, drawn 29/6/1908. Fig. 11. Pupa, eight days old, dark form, drawn 9/7/1908. Fig. 12. Imago, ♂, upper and under side.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 32.)

THE next two forms do not so clearly belong to this group, but still they are remarkable for presenting a greater display of the fulvous ground colour, the one on the fore, the other on the hind wing, though in the former case the hind wing seems to belong rather to the other or *navarina*-group, as, indeed, is the case with *hertha*, and even with *corythalia* itself. The first of the two is:—

ab. *hisopa*, Sélys-Longchamps, "Énumération des Insectes Lépidoptères de la Belgique," p. 19 (published in the 'Mémoires de la Société Scientifique de Liège, 1845). It is described as follows:—"Dessus* des ailes brun. Les supérieures avec trois bandes de taches fauves très larges, les inférieures avec une bande seule analogue antéterminale. Dessous des inférieures avec quatre taches arrondies noires à la base qui est fauve. Cette couleur terminée par du noir. Le reste d'un jaune clair, avec les nervures et une raie antéterminale noires et une série transverse de cinq taches fauves non cerclées de noir."

This series of five transverse fulvous spots evidently represents the outer band. I know no illustration of this aberration, but the description is sufficiently clear.

The name is spelt *nisopa* in the 'Annales de la Société Entomologique Belge,' i. p. 19 (1857), in the list of Belgian forms of *Lepidoptera*.

* Up. s. brown. F. w. with three very broad bands of fulvous spots, h. w. with only one corresponding antemarginal band. Un. s. h. w. with four rounded black spots at the base, which is fulvous edged with black. The rest of the wing is light yellow, with the nervures and one antemarginal line black, and a transverse series of five fulvous spots, without any black edging.

The second of these forms is the—

var. *helvetica*, Rühl, 'Societas Entomologica,' iii. p. 137 (1888), which he also describes in his 'Paläarktische Gross-Schmetterlinge,' p. 405 (1892-1895). In the former work there is a long Latin description which my respect for the author compels me to refrain from giving in the original, so startling is its construction, and which I will therefore, contrary to my usual practice, translate as follows:—"Wings scarcely rounded, fulvous above, partially reticulated with fuscous, the hind wings with the central band enlarged, in distinct streaks, and forming five definitely separate streaks, of which the second and third are longer than the first, fourth, and fifth. The hind wings beneath yellowish, with the middle band silvery white. This form is so far remarkable for a very noticeable mark in the second basal cell of the hind wings beneath, a yellow oblong spot bordered with black, alike in both wings."

This form is remarkable for three things: the complete absence of the extra line, up. s. h. w., in combination with a very restricted basal suffusion, leaving a broad central band of the ground colour, such as is usual in *parthenie*; the silvery white central band, un. s. h. w., in the male as well as the female; and the size, shape, and colour of the second spot of the basal band. It appears to be a local form found at Bergün and Stalla, in the Grisons, in July. The upper side gives a remarkable facies, which I have several times noticed in Rhone Valley specimens, but without the peculiarities of the under side, though I have also taken at Frenières, above Bex, a very fresh male with quite white terminal, central, and basal bands, the light spot also being white; this specimen, however, has a normal upper side.

To this group of aberrant forms also belong three others, viz.:—

ab. *samonica*, Riesen, 'Stettin Entomologische Zeitung,' 1891, p. 357, which is described as having the upper side of *corythalia*, but the under side normal.

ab. *virgata*, Tutt, 'British Butterflies,' p. 305 (1896), which "has the spots forming the central band of the fore and hind wings lengthened, and these make a distinctly marked central band."

ab. *obsoleta*, Tutt, *l.c.*, is thus noted: "Occasionally there is a failure, or partial failure, of the dark transverse lines, the wings becoming largely fulvous."

We must also add the local Spanish form:—

ab. *iberica*, Staudinger, 'Catalogue,' 3rd ed. p. 32 (1901), which is thus shortly described: "Plerumque major, dilutior, minus nigro picta."

Coming now to the second group of aberrations in which the fuscous predominates, the oldest named form which belongs with certainty to this species (*athalia*) seems to be:—

ab. *navarina*, Sélys-Longchamps, 'Enumération des Insectes Lépidoptères de la Belgique' (v. *supra*), p. 19, 1845. His description reads as follows* :—"Toute brune en dessus avec une série antéterminale de taches fauves. Le dessous des ailes plus noir qu'à l'ordinaire." He states that he is describing the insect figured by Ernst & Engramelle, 'Papillons de l'Europe,' vol. ii. pl. lxii. suppl. viii. figs. 31 *e, f* (1780), and referred by them, p. 252, to Esper, 'Schmetterlinge Europas,' i. p. 382, which is his description of *dictynna* illustrated on pl. xlviii. (suppl. xxiv.). Sélys-Longchamps consequently remarks that the absence of the black spots in the outer band un. s. h. w. at once removes it from *dictynna*, and, indeed, Ernst & Engramelle refer their figures back to their first volume, pl. xix. fig. 31, and the corresponding letterpress, pp. 67, 68 (1779), where a further reference is made to the previous plate of Esper (i. pl. xlvii. suppl. xxiii.), which represents *athalia*. The following description is made from the figure to which Sélys-Longchamps refers :—

Up. s. f. w. : Ground colour only shows between the subterminal lines and in a single spot outside, and two inside the stigma; on h. w. only between the outer and inner lines, and in the light spot.

Un. s. f. w. : Lunules yellow, with a few yellow spots below the costa and about half-way down the wing inside the outer subterminal; beyond this the whole wing is fulvous, with a series of six long, rather wedge-shaped, black dashes starting from the inner subterminal, a square black spot taking the place of the stigma, and an oblong black spot in the middle of the base representing the basal dash.

Un. s. h. w. : Terminal band shows dull grey spots near the arch of the lunules except at anal angle; inner part of the outer and central bands black; outer part of central band pale yellow: rest of wing fulvous, except the light spot and the first, third, and fourth spots of the basal band, which are of the same shade as the spots in the terminal lunules. (This colour may have changed in the plate.)

A variant of this aberration is figured, without name, by Hübner, 'Beiträge,' ii. pl. iv. fig. *W.* 1, 2, the under side of which has the outer part of the fore wing very pale, the spots forming the elbowed line prolonged into dashes, the stigma and the space between the basal lines being filled in with black, and the basal dash being represented by a triangular black spot. The hind wing appears to have the usual bands, but the outer has the dark lunules very slightly represented, and failing altogether towards the costa, the space between them and the central band being filled in with black in the lower half of the wing; most of the base is also black.

A Dutch specimen referable to this form is also illustrated

* "Entirely brown above, with an antemarginal series of orange-brown spots. The under side with more black than usual."

for a paper by Capper in the 'Tijdschrift voor Entomologie,' vol. xlii. pl. ii. fig. 3, the upper side of which is definitely *navarina*, but the under side is nearly normal, except that the elbowed line is again represented by a series of black dashes. Fig. 4 on the same plate represents a transitional female, showing on the upper side two rows of fulvous spots on the fore wing, and part of a third row on the hind wing. The under side is like that of the male, except that the black dashes representing the elbowed line are shorter.

ab. *aphæa*, Hübner, 'Sammlung,' vol. i. pl. 147, figs. 738, 739, probably represents an aberrant form of this species, but in the absence of date and locality it is impossible to speak with confidence. Most authors have, however, accepted it as such without question. The following is a description:—

Un. s. f. w.: Outer subterminal coalescing with border; inner subterminal very fine; elbowed line very broad, almost reaching the inner subterminal; the basal suffusion forms two large black spots, one above the median nervure reaching to the inner basal line, and another below it joining the marginal blotch; beyond the outer basal line is a black blotch followed by yet another surrounded by a thin line of the ground colour, which expands into a bar towards the inner margin.

Up. s. h. w.: Has a broad black border, followed by a narrow lunular line of the ground colour, edged with an equally narrow lunular line of black representing the outer line; the basal suffusion extends to the inner line, but shows just within the latter a row and part of a second row of very small spots of the ground colour; the light basal spot is prolonged into a scimitar-shaped curve up to the costa.

Un. s. f. w.: Has black lunules almost filling the usual terminal lunules, whose arrangement rather suggests *parthenie*. This peculiarity is exaggerated on the hind wing. The elbowed line is represented by large elongated spots, and the basal band of the hind wing is completely invaded by the dark inner band; otherwise the under side is fairly normal.

This must not be confounded with Freyer's *aphæa*, 'Neüere Beiträge,' vii. p. 169, pl. 696, fig. 1 (1858), which appears to be a form of *parthenie* which one meets with occasionally in the Rhone Valley, and doubtless elsewhere. Its sole distinction, which, however, produces a very remarkable facies, is the great breadth of the elbowed line, and the unusual size of the marginal blotch on the upper side.

This form brings us by a natural sequence, though somewhat out of chronological order, to the corresponding form of *athalia*, var. *mehadiensis*, Gerhardt, 'Berliner Entomologischer Zeitschrift,' vol. xxvi. p. 126 (1882). It is described as follows*:—

* A very beautiful aberration of *athalia*, striking in consequence of its pronounced markings; from Viertlau, Mehadia (Hungary); rather larger than ordinary *athalia*; the black band crossing the middle of the fore wing

“Eine sehr schöne, durch deutlich ausgesprochene Zeichnung auffallende Abart von *Athalia*: von Viertlau, Mehadia: etwas grösser als die gewöhnliche *Athalia*; die in der Mitte der Oberflügel über den ganzen Flügel sich ziehende schwarze Binde ist breiter als bei der Stammart, und endet am Innenrand in einen länglich viereckigen Fleck, der bei der Stammart gewöhnlich nur durchbrochen erscheint. Auch auf der Unterseite ist die Binde weit deutlicher markirt als bei der gewöhnlichen *Athalia*.“

Here again the breadth of the elbowed line and the large oblong marginal blotch are the special characteristics. It appears to be rather a variety than an aberration, and so far as the upper side is concerned it is, apart from size, the usual form at Faïdo, in the Leventina, and indeed, in a more or less modified condition, the only form I have seen from that locality.

(To be continued.)

ORIENTAL CAPSIDÆ.

By W. L. DISTANT.

MR. R. I. Pocock, who is working out the mimetic relationship between various insects and spiders included in a collection from the Nilgiri Hills, has asked me to identify the following Rhynchota, in order that he may be able to refer to them in his paper shortly to be published in the 'Transactions' of the Linnean Society of London. All the species belong to the Capsidæ, are apparently undescribed, and will be figured in the Appendix to my Rhynchotal portion of the Faun. Brit. India.

RHODOCLIA, gen. nov.

Head broad and convex, a little more anteriorly produced in male than in female, the postocular longer than the anteocular area, strongly constricted at base, slightly longitudinally incised on centre of disk, the apex subangularly produced in front of the insertion of the antennæ, eyes of moderate size and rounded; antennæ long, longer than the body, first joint longer than either the second or third which are subequal in length, fourth longest, moderately thickened and a little curved; rostrum passing the intermediate coxæ, first joint thickened and about reaching eyes, second longest; pronotum short, armed with a long horizontal or slightly backwardly directed slender spine on each side; hemelytra more or less rudimentary, more developed in the male than in the female; abdomen

is broader than in the type, and ends on the inner margin in a longish four-cornered spot, which in the type generally appears broken up. On the under side also the band is far more strongly marked than in ordinary *athalia*.

short and broad, pedunculate at base; legs long and slender, basal and apical joints of tarsi about equally long, tibiæ distinctly longer than the femora.

This genus may be placed in the Division Myrmecophyaria, Reut.

Rhodoclia convictionis, sp. n.

Head, pronotum, scutellum, and hemelytra piceous-brown; head with a pale ochraceous line extending centrally and perpendicularly for a short distance from base, and then curved and diverging on each side to the anterior margins of eyes; scutellum with a central pale longitudinal line; abdomen greyish ochraceous; head beneath, sternum, rostrum, and legs pale brownish ochraceous; the pedunculate base of abdomen centrally piceous, with the lateral margins greyish; legs and antennæ thinly spinously hirsute, the head also margined with pale long hairs. Long. ♂ 6 to 8, ♀ $5\frac{1}{2}$ to 6 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

ZARATUS, gen. nov.

Head subtriangular, obliquely deflected in front of eyes, moderately centrally longitudinally sulcate on disk, eyes of moderate size but a little projecting beyond the anterior margin of the pronotum; antennæ with the first joint nearly as long as head, second joint more than twice as long as first, third longer than first, fourth mutilated; rostrum not reaching the anterior coxæ, first joint about reaching base of head; pronotum elongate, but a little broader at base than long, transversely constricted a little before anterior margin, posteriorly convexly tumid, anterior and posterior margins truncate, the lateral margins narrowing to apex, angularly sinuate at the transverse constriction, thence straight to anterior margin; scutellum small, subtriangular; clavus long, almost reaching to base of cuneus; corium with the lateral margins strongly concavely sinuate, broadly widened at the cuneal area; membrane slightly passing the abdominal apex; abdomen broad, globose, constricted at base; legs of moderate length, the posterior tarsi mutilated.

Allied to the Neotropical genus *Zosippus*, Dist., from which it principally differs by the unarmed scutellum.

Zaratus repandus, sp. n.

Head, pronotum, and scutellum pale cinnamon-brown; scutellum with an obscure pale concave line and a small basal spot; corium pale cinnamon-brown, an oblique basal spot on each side, which are almost connected with a transverse spot beyond apex of scutellum, and a transverse concave fascia on each side before cuneus whitish, the cuneal suture more obscurely whitish; membrane black, with an obscure pale transverse fascia near base; legs pale cinnamon-brown, apices of femora and about apical thirds of tibiæ and the tarsi pale stramineous, apices of tarsi black (posterior tarsi mutilated); antennæ pale ochraceous, third joint, excluding base, black; body beneath imperfectly seen in carded specimens. Long. 4 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

Armachanus nilgiriensis, sp. n.

Pale brownish ochraceous, a transverse linear white fascia crossing clavus near apex of scutellum, and an oblique similar fascia near middle of corium; before the latter the lateral area is also more or less greyish white; cuneus with a prominent black basal spot; membrane very pale fuliginous; body beneath and legs unicolorous. Somewhat closely allied to *A. monoceros*, Dist., but a more slender and attenuated species, the posterior pronotal area shorter, the anterior area longer, narrower, and moderately narrowed at base, thus bringing the two areas or lobes into more divisional character and into greater contrast; the head is more elongate, and has a median longitudinal darker line; the scutellum, clavus, and central area of corium are not darker in hue as in *A. monoceros*, but concolorous with the general pale brownish ochraceous coloration. Long. 6 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

Nicostratus princeps, sp. n.

Brownish ochraceous; a transverse white fascia crossing corium and clavus at apex of scutellum; membrane piceous; head very large and globose, almost circular, about as long as broad, with a transverse rounded incised line between the eyes; antennæ pale ochraceous, apices of second and third joints, and the apical joint excluding base, black, second joint subequal in length to that of third and fourth together; pronotum strongly transversely constricted before middle, the anterior area or lobe narrow and armed with two strong diverging spines, the posterior area or lobe globosely tumid, deflected anteriorly, the lateral angles subprominent, the posterior margin very slightly concavely sinuate; scutellum developed into a strong upright semi-acute spine; corium with the lateral margins concavely sinuate, widened and tumid at apices; membrane considerably passing the abdominal apex; legs almost uniformly brownish ochraceous. Length, 5 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

Strongly differing from *N. balteatus*, Dist., by the much larger and more strongly developed head, different colour, more acute spine to scutellum, &c.

COMACLA SENEX, HB., AB. FUMOSA, N. AB.

BY EUSTACE R. BANKES, M.A., F.E.S.

Fore wings smoky brown. Hind wings rather paler. The usual blackish markings are present on all the wings, but are rendered very inconspicuous by the darkness of the ground-colour. Head, thorax, abdomen, &c., proportionately dark as compared with the type.

This aberration, which I have not seen from elsewhere, and of which I have failed to find any published figure or description,

occurred to me very sparingly, in 1906-7, in the Isle of Purbeck, Dorset, in company with numerous examples of the better-known forms, and my captures included individuals of every shade between the darkest representatives of *ab. fumosa* and the typical form. The fact that I have not taken any females referable to *ab. fumosa* affords no good reason for supposing that this dusky aberration is confined to the opposite sex, for the total number of females that has rewarded my efforts is very limited.

Norden, Corfe Castle: Nov. 10th, 1903.

NOTES ON BRACONIDÆ.—VIII.: ON A PART OF MARSHALL'S COLLECTION.

BY CLAUDE MORLEY, F.E.S., &c.

WHILE looking through the earlier part of the Rev. T. A. Marshall's collection of Braconidæ, which has now passed from the late Dr. P. B. Mason to a resting place in the British Museum, in January, I jotted down a few notes, which will add several species to the British list, and others of general interest.

I should, first, like to say that my record of *Bracon flavator*, Fab., as an indigenous species (E. M. M. 1908, p. 269) is quite wrong; the insect is in reality *Doryctes leucogaster*, Nees, a common kind along all the coasts of the Mediterranean, and known to extend as far north as Central Europe, though no mention of it as British exists. It has been several times bred from the Longicorn beetles *Rhagium indagator* and *Hylotrypes bajulus*. There is, however, certainly a female of *B. flavator*, Fab., in the Stephensian collection, under the name *B. denigrator*, applied by Curtis (B. E. pl. lxix.) to *Proterops nigripennis*, Wesm. This may, of course, be British, though none have since been discovered. I found a single female of *Bracon impostor*, Scop., under the same name in Stephens's collection. This is a somewhat frequent species in Central and Southern Europe, preying upon *Monochammus sutor*, a Longicorn occasionally introduced into the British docks, though doubtfully indigenous, and its parasite may have been similarly imported. *Bracon initiator* of Stephens's collection (et Wesm. nec Fab.) = *Cœliodes scolyticida*, Wesm., male and female. *Bracon instabilis*, Marsh. (André, xv. 1897, 70) from Cornwall (type in Brit. Mus., with a second, both labelled "Botusfleming"), and *B. virgatus*, Marsh. (*lib. cit.* 68) from Cornwall (type in Brit. Mus., labelled "Botusfleming," with a second from Cameron's collection, labelled "Marsh Mills, June 30th"), are new to Britain. *B. roberti*,

which I erroneously stated (E. M. M. 1908, p. 269) to have been hitherto not bred, is said (André, xv. 1897, 80) to have been raised by Bignell, in Devon, from *Coccyx strobilella*, Linn. There are specimens of *Bracon abscissor*, first noted as indigenous by me (E. M. M. 1906, p. 109), from Swanage, Nunton in Wilts, Cornworthy, Botusfleming, and Niton, in Isle of Wight; it is probably not rare. Of *B. piger*, Wesm., previously only noted from Belgium, there are examples from both Cornworthy, in Devonshire, and Nantes, in France. *B. intercessor* is not recorded as British; there is a male bred "by W. H. B. Fletcher from *Gelechia obsoletella*; Bridgman has three more," presumably contained in his collection, now in the Castle Museum at Norwich. A female *Bracon scutellaris*, Wesm., also new to Britain, is labelled "Plumstead, 1st June, 1893." *B. subcylindricus*, Wesm., is represented as indigenous by a single female, captured by Marshall in the "Isle of Wight." I have just examined a female *B. fulvipes*, Nees, bred by H. M. Edelsten on July 15th, 1908, from *Cænobia rufa*.

Exothecus incertus, Wesm., must be added to our fauna on the strength of a single male in Marshall's collection, captured by him at Botusfleming, in Cornwall. In like manner we must include *Clinocentrus stigmaticus*, Marsh., next to our *C. vestigator*, on the strength of an example (not in the collection), recorded by him (André, xv. 131). *Allodorus semirugosus*, Nees, has not been found with us before. There are three examples in the collection, two labelled "Aviemore, 23, 76," by Champion, and one from "Rannoch," in Marshall's handwriting; it is one of the *Sigalphides*. It is very remarkable how few of each species Marshall possessed in the Areolarii; nearly all are represented by one, two, or three specimens only. The most populous is *Apanteles fulvipes*, Hal., of which there are eighteen. Nearly all the bred examples are from Bignell's collection, and one can but wonder that, with such a paucity of material, Marshall arrived at so full a knowledge of the group; how full it is can only be shown by subsequent work upon it, though personally I have found but few specimens which could not be assigned to one or other of his excellent descriptions. Of *Agathis* there are but two males of *A. brevisetis*, Nees, and a single female of his *A. angelicæ* from Britain; though *A. malvacearum* is represented from Corsica, *A. nigra* from Nantua, in the Jura Mountains, and *A. tibialis*, ex coll. Konow, from Mecklenberg. Marshall had already taken *Apanteles tenebrosus*, brought forward by me from Britain (Entom. May, 1906), at Nunton, in Wilts. *Microdus pumilus*, Ratz., also new to our fauna, is represented by a female found by him at Cornworthy, near Totnes.

MEMBERS OF THE ENTOMOLOGICAL CLUB FROM ITS ESTABLISHMENT IN 1826 TO THE PRESENT TIME.

1826.

Club instituted by Mr. George Samouelle in conjunction with Messrs. *A. H. Davis, *S. Hanson, and E. Newman.

1832.

†Rev. C. S. Bird, Messrs. *W. Bennett, J. S. Bowerbank, †W. Christy, Jun., †J. Curtis, A. H. Davis, E. Doubleday, S. Hanson, *J. Hoyer, E. Newman, F. Walker, and *J. J. Walton.

1836.

In this year a Constitution and Bye Laws were drawn up and printed. The eight members being—Messrs. W. Bennett, *J. B. Bevington, J. S. Bowerbank, *J. F. Christy, A. H. Davis, J. Hoyer, E. Newman, and F. Walker.

1841–1864.

- Mr. W. Bennett (removed into country, 1851).
- Dr. J. S. Bowerbank (died March 8th, 1877).
- Mr. J. F. Christy (died April, 1851).
- Mr. E. Doubleday (died December, 1849).
- Mr. J. Hoyer (died 1848).
- *Mr. T. Marshall (resigned 1848).
- Mr. E. Newman (died June 12th, 1876).
- Mr. J. Walton (removed into the country, 1852).
- Mr. S. Stevens (elected November, 1852; died 1899).
- Mr. David W. Mitchell (elected 1849).
- Mr. W. Spence (elected 1850; resigned 1858).
- *Mr. Mathew Marshall (elected 1850; resigned 1859).
- *Mr. Alfred White (elected 1851; resigned 1852).
- Mr. J. F. Stephens (elected Nov., 1852; died Dec., 1852).
- Dr. Power (elected 1857; resigned 1882).
- Mr. F. Grut (elected 1857; died 1891).
- Mr. Horace Francis (elected 1859; resigned 1861).
- Mr. G. R. Waterhouse (elected 1859; resigned 1864).
- *Mr. Henry Adams (elected 1861; resigned 1876).
- Mr. Philip Harper (elected 1864; resigned 1866).
- Mr. Edward Sheppard (elected 1864; died 1883).

1865.

On January 18th of this year the membership was increased to nine instead of eight.

- Rev. Hamlet Clark (elected 1865; died 1867).
- Mr. Joseph S. Baly (elected 1866; resigned 1869).
- Mr. Osbert Salvin (elected 1867; resigned 1869).
- Dr. Battershall Gill (elected 1870; resigned 1873).
- Dr. B. T. Lowne* (elected 1873; appointed curator 1876).
- *Mr. Charles Dupré (elected 1873).

† Honorary Member (?)

- *Dr. Edward Hart Vinen (elected 1876).
 *Mr. Henry Virtue Tibbs (elected 1876).
 Mr. Peter Hinckes Bird (elected 1880).
 Rev. George Henslow (elected 1881).
 Dr. William Francis (elected 1881 ; died 1904).
 Dr. Christopher Dresser (elected 1883).
 *Dr. Thudichum (elected 1884).
Mr. G. H. Verrall (elected 1887).
 Dr. Philip Brooke Mason (elected 1891 ; died 1903).
Mr. Robert Adkin (elected October, 1892).

1898.

A new Code of Laws adopted. Membership reduced to eight.
Mr. G. T. Porritt (elected January, 1898).
Mr. T. W. Hall (elected January, 1898).
Mr. Horace St. John Donisthorpe (elected November, 1900).
 Mr. Arthur Chitty (elected March, 1904 : died 1908).
Prof. E. B. Poulton (elected March, 1904).
Mr. H. Rowland-Brown (elected May, 1908).

The names of the present members of the Club are printed in italics. It is hoped that some of our readers may be able to furnish short biographical notes of those members indicated in the above list by an asterisk.

An historical sketch of the Entomological Club is published in the 'Entomologist' for 1892, pp. 4-9, and there is further reference to it in the 1899 volume of the same Journal, pp. 160-164 and 224-226. The Laws of the Club are printed in the 'Entomologist' for 1898, pp. 41-42.

RICHARD SOUTH, *Hon. Sec.*

NOTES AND OBSERVATIONS.

THE AB. PORRITII OF *CIDARIA SUFFUMATA*. — For the sake of clearness in the future it seems advisable to state that the figure of *Cidaria suffumata* given as ab. *porritii* in Mr. South's most excellent second volume of the 'Moths of the British Isles' just published (plate 72, fig. 2) does not represent the form as originally named by Robson. The figure has evidently been taken from a specimen of the well-known so-called "Dover form," whereas the ab. *porritii* is really a black and white moth, the white by daylight being a little "creamy." The basal mark and central band are black, the rest of the wings white, with the exception of the short line near the apex of the fore wings, the minute marginal dots, and the faint darker clouding at the base of the hind wings. The form is well figured in the 'Entomologist' of May, 1878, and in Barrett's 'Lepidoptera of the British Islands,' vol. viii. pl. 359, figs. 1*d* and 1*h*. The "Dover form" has the pale parts of the wings marked with brown. It also always occurs in South-west Yorkshire along with ab. *porritii*, and in much greater numbers, and that ab. *porritii* is the extreme form of it (in which the brown is obliterated) is proved, I think, by the fact that I

have bred it from a pairing of the "Dover form."—GEO. T. PORRITT ; Elm Lea, Dalton, Huddersfield, February 10th, 1909.

THERONIA ATALANTÆ, Poda, AS BRITISH. — I have seen a fine female of this species in the British Museum, which was captured "near Ramsgate, September, 1891," but the identity of the captor is doubtful (*cf.* my 'Ichneumons of Britain,' iii. 51). This distinct and handsome species, which preys mainly upon Rhopalocera, may now be considered as certainly indigenous to our fauna.—CLAUDE MORLEY.

THE ENTOMOLOGICAL CLUB.—Since the last report (Entom. xli. 229) meetings of this Club were held at 58, Kensington Mansions, South Kensington, on December 8th, 1908, and in the Council Chamber of the Holborn Restaurant on January 19th, 1909.

On the date first mentioned Mr. Horace St. John K. Donisthorpe was in the chair, and the other members present were Messrs. R. Adkin, H. Rowland-Brown, and G. H. Verrall; the additional guests numbered fourteen. At this meeting Mr. Rowland-Brown proposed that Mr. A. H. Jones be elected an Honorary Member of the Club; this having been seconded by Mr. Donisthorpe was carried.

At the Holborn meeting, which is recognized as the "Annual" of the Club, Mr. G. H. Verrall occupied the chair, as it has been his wont to do at about the same date for the past twenty-two years. Other members present were Messrs. R. Adkin, H. St. John K. Donisthorpe, and T. W. Hall; and of other entomologists invited as guests nearly seventy attended. After supper the chairman, in proposing the toast of the "Entomological Club," made some apt remarks on the seeming lack of workers and students in British insects other than Lepidoptera. Later on, in replying to the toast of "Our Host," which was proposed by Dr. Dixey and acclaimed with musical honours by the guests, Mr. Verrall mentioned that biographical details of some past members of the Club were still wanted to complete the set of memoirs in course of preparation.

(For list of past and present members of the Entomological Club, see p. 63).—RICHARD SOUTH, Hon. Sec.

CAPTURES AND FIELD REPORTS.

EARLY APPEARANCE OF *EUPITHECIA PUMILATA*. — A specimen of this pretty little moth was found to-day at rest on the wall of an upstairs passage in this house, not far from a landing-window, through which it must have flown, probably attracted by an adjacent gaslight. This is a remarkably early date, but the weather for the past three or four weeks has been so abnormally changeable that one is scarcely surprised at it. After a week's hard frost, at the end of December, the New Year commenced with a spell of mild weather, which lasted until January 19th, when frost set in again, and went on until the end of the month, the last three or four days being very severe. Then on February 1st it became suddenly very mild, the thermometer for three

days rising as high as 56° and 57° , and keeping above 50° throughout the night—the sort of temperature one expects towards the end of May—but on the 6th it became cold again, and to-day there has been the heaviest fall of snow we have had for some years. The moth looks as if it had been out for some days, so it most likely emerged during the very warm weather we had at the beginning of the month. GERVASE F. MATHEW; Dovercourt, Essex, February 10th, 1909.

BAPTA BIMACULATA IN LINCOLNSHIRE.—I have taken *B. bimaculata* here in 1906, 1907, and 1908. These constitute, I believe, the only records for this moth for Lincolnshire.—SAVIGNAC B. STEDMAN; Binbrook, Market Rasen, Lincoln.

DYSCHORISTA SUSPECTA IN SURREY.—My brother very kindly sugars for me in Surrey, and last July he sent me a series of nearly twenty specimens of *Dyschorista suspecta*, captured near Effingham. As *suspecta* is always described as a northern insect, this record may be worth insertion.—SAVIGNAC B. STEDMAN.

[This species was taken pretty freely in the New Forest, Hampshire, in 1896; it has also been recorded from other southern counties.—ED.]

NOTES FROM HASLEMERE FOR 1908.—In continuation of my notes for 1906–7 (*vide* Entom. vol. xli. p. 157), the following may be of interest:—*Limenitis sibylla* has been observed in more than one spot about here, and I imagine it is quite firmly established. I had no opportunity of obtaining the larvæ, but hope to do so this year. On June 15th I obtained ova of *Cænonympha pamphilus* in large numbers, and the larvæ began to emerge on June 28th. They all fed very slowly, and none pupated in the autumn. I have kept them supplied with grass all the winter, and they appear to have been eating in very small quantities without any break. The largest is now little more than half an inch long. Two female specimens of *Callophrys rubi* deposited about forty ova on laburnum shoots on May 29th. The resultant larvæ appeared on June 5th, and fed up successfully on the flowers and later on the leaves of broom. The first one pupated on July 14th. Larvæ of *Zephyrus quercus*, beaten on June 3rd, appeared to be even more than usually ichneumonised, but I got through some fine imagines on July 5th and following days. After diligent searching in their known haunts I succeeded in finding ova on Nov. 4th. Spring forms of *Cyaniris argiolus* began to emerge on April 4th, though the first date on which I saw wild ones was May 27th. A brood of larvæ, which hatched on June 6th, and which began to pupate on July 11th, produced some imagines on July 30th, but several of the pupæ stood over the winter. It was difficult, especially during the later stages, to procure holly blossoms, but the larvæ, though preferring the flowers, very readily ate the young holly leaves.

Among interesting captures by day may be mentioned:—*Hyllophila prasinana*, *H. bicolorana*, *Lithosia mesomella*, *Nemeophila russula*, *Hepialus humuli*, *Drepana binaria*, *Heliaca tenebrata*, *Erastria fasciana*, *Epione advenaria*, *Metrocampa margaritaria*, *Eurymene dolabraria*, *Numeria pulveraria*, *Bupalus piniaria*, *Pachynemema hip-*

pocastanaria, *Coremia designata*, *Cidaria suffumata*, and *Chesias rufata*.

Larvæ of the following, among others, were taken:—*Notodonta ziczac*, *Thyatira batis*, *Gortyna ochracea*, *Panolis piniperda*, *Miselia oxyacanthæ*, *Agriopis aprilina*, *Hadena protea*; and ova were obtained from *Pæcilocampa populi*, *Epunda nigra*, *Coremia designata*, *Chesias spartiata*, and many others.

From the street-lamps the most noteworthy captures were:—*Pæcilocampa populi* (in greater profusion than ever before within my experience), *Notodonta dictæa*, *N. trimacula*, *Polyploca flavicornis*, *Demas coryli*, *Asteroscopus sphinx*, *Eupithecia pulchellata*, *E. succentaureata*, *Cidaria siterata*, *C. miata*, *C. suffumata*, *C. silaceata* var. *insulata*, and *Aniatis plagiata*.

Sugaring in my garden produced:—*Acronycta psi*, *A. aceris*, *Dipterygia scabriuscula*, *Apamea basilinea*, *A. gemina*, *Miana strigilis*, *M. fasciuncula*, *Rusina tenebrosa*, *Noctua festiva*, *Orthosia lota*, *Cerastis vaccinii*, *C. ligula*, *Scopelosoma satellitia*, *Xanthia cerago* var. *flavescens*, *Epunda nigra*, *Miselia oxyacanthæ*, *Agriopis aprilina*, *Aplecta prasina*, *A. miata*, *Hadena protea*, *H. thalassina*, *Calocampa exoleta*, and *Xylina semibrunnea*. It is perhaps worth recording that a friend of mine, who was sugaring almost every night about three miles from my house, took two specimens of *Cymatophora fluctuosa*.

In most cases I have made no mention of the species taken by me here in previous years, the majority of which turned up again. But the interesting list of new species taken by my friend and myself in 1908 leads us to regard this as a very favourable locality, and we hope to be able to work it even more thoroughly this year.—F. A. OLD-AKER, M.A.; The Red House, Haslemere, Feb. 16th, 1909.

ENTOMOLOGY IN CORNWALL AND DEVON IN JULY, 1908.—Contrary to my usual custom of spending my holiday on the Continent, I last season decided to give old England another trial. Having re-read a very interesting article by Mr. A. E. Gibbs in the 'Entomologist' (vol. xxxix.) on a holiday he spent at Polzeath, and what specimens he collected there, I decided to follow out Mr. Gibbs's directions, and accordingly caught the 6.20 a.m. train from Waterloo (a comfortable corridor), which did not stop between London and Salisbury. At Okehampton we had to change into a slower train, but the scenery being so beautiful one did not regret the slower progress. I reached Wadebridge at one o'clock; it had been raining, and I at once inquired at the station about a conveyance for getting my stock of treacle, carbide, "setting house," and other heavy luggage taken the seven miles. As luck would have it there was a carrier going that way there and then. I next asked about accommodation; one man informed me he knew of no place where one could stay, but the carrier's boy, who now came upon the scene, informed me that there was a lady who "took people in," and I felt greatly relieved until the boy added he did not know if the lady in question was "full up" or not. However, I decided to risk it, and immediately made for the Station Hotel, and, having lunched, the rain seeming over, I mounted my bike and made a start. After a mile or so the rain came on again so much so that I took shelter under some trees; after some time I

donned my waterproof suit and decided to ride through it, the clouds cleared, and it was then pleasant travelling, and at length I reached Polzeath. I was told the name was originally Hayle, and it was altered because the people would insist on pronouncing it as if it was the infernal regions. I found the lady was "full up," and I had to search elsewhere. The next Cove, Trebetherick, contained a boarding-house, principally used by golfers, but was then almost empty, and Mr. Buse, the landlord, made me very comfortable, the *ménage* was excellent, and the charges were very moderate. There are only two or three more houses in the place, and these are farms. The spot is really just at the mouth of the river Camel (from which Camelford takes its name). A few minutes' walk brought me down to the sea (or river, whichever one likes to call it). It seemed an ideal spot for "sugaring"—there was a row of posts, also sand-hills, and a field of thistles and ragwort—and I decided to give it a trial the same evening; but, alas, the only thing I took out of the common was *Agrotis valligera*, one specimen; *Leucania conigera*, *L. lithargyria*, and, of course, the ubiquitous *Xylophasia polyodon* were plentiful.

The next day I decided to search for Mr. Gibbs's spot, so fully described, as before stated; having discovered it, I decided to work it the same evening. I may say along the road during the afternoon I discovered a wing of *Agrotis lunigera* in a spider's web, so I knew one of the moths which I hoped to get was about. I had never taken this species, although I had tried Freshwater for it, but Mr. A. J. Hodges told me the time of appearance given by Newman is incorrect, and that is probably the reason why I had never captured the insect. I took but one specimen of *lunigera* that night. I think the place must have altered considerably since Mr. Gibbs was there; there are very few posts, and they are across a ditch and much overgrown with foliage. The other *Leucanias* I have mentioned appeared again. The next night I was more successful, and secured three *lunigera*; altogether I captured seven during my stay. I saw nothing of *Neuria saponariae*, *Hadena adusta*, and *Triphæna interjecta*; never having previously taken these species, I was naturally disappointed. Mr. Gibbs thinks a house is now built on the spot where he used to get them. *M. rivata* and *E. mensuraria* were netted. I was detained a whole week by the English weather (I won't say climate). An American, on being asked what he thought of our English climate, replied, "I guess you ain't got no climate, it's all weather," and this is generally true so far as my experience goes.

The first fine sunny day I rose at seven, and cycled to St. Ives. As this article is for a scientific journal, I must not give too much of what, for want of a better appellation, I may call "domestic" news. I will then not give details of the very pleasant spin over the moors, up hill and down dale, in the fifty-five miles' spin to St. Ives. At Hayle Bay the sand-hills are enormous, reminding one of the Boulogne-Abbeville route. Large quantities of red valerian and wild flowers are found along the cliffs at St. Ives, but I netted nothing of importance. Delayed a few hours next day by the weather again, I was late in leaving for Land's End; I found a comfortable hotel there, and a landlord that Charles Dickens might have made use of.

He told me that if I purchased curiosities and other things he had for sale and sent them to my friends, they would exclaim, "How kind it is of my friend to send me these pretty things." Well, to return to the Lepidoptera. I treacled rocks and flowers suitable to hold that substance, and the result was the common species before mentioned. It was very lovely at Land's End, the sun was shining brightly when I left, and I had an enjoyable spin to Penzance, went over St. Michael's Mount; but if one has visited Mont St. Michel in Normandy, it is only waste of time to visit the English mount. I, however, discovered some *Silene maritima* in the castle grounds. I had been searching in vain for this plant in Polzeath in hopes of getting *Dianthæcia barrettii*; although I found some plants on my return, and visited them by night, I saw nothing of the moth. Having trained to Truro, I rode the rest of the way *viâ* Padstow Ferry to Rock (but I don't advise anyone to go this way, at least, not with a bicycle), and reached Polzeath in time to treacle the same night.

Having sent home some of my luggage, I left for Tintagel and Boscastle, sugared along the cliffs of the latter place, but had no luck. At Bude I found a few sand-hills, and had the same bad luck with regard to captures. The most charming spot I think I have ever seen (Clovelly) was reached the next day, and thence, *viâ* Bideford and Barnstaple, to the famous Braunton Burrows. I stayed at a very comfortable golf house at Saunton, above the Burrows; the latter comprise three miles of sand-hills. Finding no posts I sugared flowers, but nothing other than common species were taken. I cycled the three miles on the sands to the lighthouse, and then found I was opposite Instow, from which place I once, years ago, joined some entomological friends and went for a picnic to the lighthouse; I had no idea it was Braunton Burrows at that time. I collected a quantity of sticks, stuck them in the sand-hills, and sugared them the same evening, but the same bad luck attended me.

I may mention I was trying a new experiment on this tour; instead of "papering" my captures (readers may ask what captures? and with reason, for as yet I had very few), I was setting everything I took while fresh, and for this purpose was carrying a "drying house" with me on the front "luggage-carrier" of my bicycle; this mode of setting things when fresh is much preferable to relaxing and setting specimens after one's return home. I always experience a difficulty in relaxing and setting British moths when once they have become dry, the antennæ are almost always stiff and refuse to go in the desired position. Mr. Newman's new relaxing-tin may overcome this trouble; so far I have found it very useful, I have left an insect in for over a month without any appearance of mould. After leaving Braunton I made for Barnstaple, and soon got on the Lynton Road, which, winding as it does in and out along the valleys over moors in places and through woods occasionally, makes cycling very enjoyable. A sharp descent brings one into the picturesque village of Paracombe.

At length one arrives at the model town of Lynton, which owes its popularity largely to Sir George Newnes, M.P. A long and steep descent, rather too rough to ride down with any pleasure, and one is

in the bright little village of Lynmouth. After having selected an hotel, I made my way along the Lynn in search of the hemp-agrimony, and noting two or three likely looking places, visited these later in the evening and was rewarded by a specimen of *Toxocampa cracca*. This moth does not settle like a butterfly, with closed upright wings as I expected, but like a *Triphæna*. I stayed three days longer in hopes of taking additional specimens, but saw no more. Along the Lynn immense quantities of valerian are found, and the cottage-gardens are full of it. It grows along the cliffs in profusion, and this is its natural habitat I conclude. In the daytime the agrimony is a tremendous attraction for all kinds of insects. *Macroglossa stellatarum*, the Vanessidæ, Theclas, and many other lepidopterous insects I saw, as well as Hymenoptera, etc., in quantities.

On leaving Lynmouth I was told I should have a three-mile walk up Countessbury Hill before I could mount my cycle, but by the aid of my 50-inch Pedersen gear I only had to push my machine for about one mile. The road continues undulating for some distance just skirting Exmoor until one reaches Minehead, where the coast is very flat. The Exeter route was now followed, passing the quaint little town of Dunster. The road winds along the valleys, and is practically downhill to Exeter. I stopped a night at Star Cross, but Dawlish Warren, like Deal and so many of our collecting-grounds, is being ruined by golfers; besides this, a railway-station has been built there, and numerous bungalows, so that there is not much ground left from an entomological point of view.

I did some hedge-beating one afternoon in hopes of disturbing *Callimorpha hera*, when I heard a voice say, "You wont get *hera* there, it is too dusty." I turned round and saw a clergyman in a trap with a harmonium; he informed me that he it was who first discovered the species there, but, he said, "*hera* is not a coast insect, it is a garden insect," and added, "you would be more likely to find it in the lanes at the back, away from the main road." This I tried, but was not fortunate enough to get a specimen; the only thing I netted was a dwarf *Pieris rapæ* exactly one inch across the wings. Feeling a bit sick of seeing my setting-boards so empty I decided to look up my friend Mr. Walker, of Torquay; this I did, and he took me to his spot for *Leucania putrescens*; we got a dozen each the same night.

I was informed that it was no use trying to catch this insect before 10 p.m.; if netted they are so wild that they soon become useless as specimens. Mr. Walker put me up to a dodge that was entirely new to me. When there are no posts or suitable places to treacle, cut a number of flower-heads of the wild carrot, treacle these and place them about in hedges and other convenient places.

We went to a fen out Newton Abbot way one night, but owing to a puncture I was not able to be there in time to sugar. *T. pastinum* is found there; the only thing at all out of the common which I got was *Noctua umbrosa*. Leaving Torquay, the next day I cycled to Exeter and trained home, after a very enjoyable twenty-three days, having seen perhaps the best of Cornwall and Devon.

I may say my "drying-house" travelled over the two hundred

and sixty odd miles, much of which was literally, "up hill and down dale," admirably; hardly a pin or brace was loose. Of course I had some "packing," consisting of some of my clothes outside the "drying-house" to lessen the jolting. I should like to add that I am desiring a companion for a three months' collecting trip to the West Indies, starting in May.—WALTER DANNATT, F.Z.S., &c.; Donnington, Blackheath, S.E.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 3rd, 1909.*—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—The President announced that he had nominated Dr. Karl Jordan, Ph.D., Dr. George Blundell Longstaff, M.A., M.D., and Mr. Charles Owen Waterhouse, Vice-Presidents for the Session 1909-10.—Mr. Leopold Arnon Vidler, of the Camelite Stone House, Rye, was elected a Fellow of the Society.—The President announced the resignation of Professor E. B. Poulton, M.A., D.Sc., F.R.S., as a member of the Council, and the election of Professor Thomas Hudson Beare, F.R.S.E., to serve in his place.—Dr. K. Jordan exhibited some Oriental *Papilio* illustrating polymorphism, and demonstrated that in *P. clytia* and *P. dissimilis* we have to do with one dimorphic species; and that *P. paradoxa* and *P. caunus* also are forms of one species only.—Mr. O. E. Janson showed a cockroach and a beetle from the Celebes, exhibiting a remarkable case of mimicry; the former apparently an undescribed species of *Prasoplecta*, the latter identified as *Cælophora formosa*, Crotch.—Mr. W. Parkinson Curtis sent for exhibition two specimens, a male and female of *Agrotis vestigialis*, Rott., from Purbeck, Dorset. When working the sandhills he noticed the dead female apparently sitting on the grass, and then noticed that she had a part of the male appendages attached to her. He then found the male, which a common earwig was busily engaged in devouring. The earwig, he thought, had attacked the pair *in cop.*, but he had never noticed a similar case before. Dr. T. A. Chapman felt it impossible to accept the conclusion arrived at by the exhibitor with regard to the earwig. An earwig would probably not attack a living *Agrotis*; if it did the *Agrotis* would undoubtedly repel it successfully. He suggested that some accident had happened to the moths, whether from some bird or beast there was no evidence to show.—Mr. C. O. Waterhouse exhibited a specimen of *Acridium peregrinum* from a swarm estimated to number 107,520,000, that visited Las Palmas, Grand Canary, in October, 1908; also a dragonfly, *Tramea basilaris*, a species which had occurred in such numbers on one occasion in Portuguese Congo that the natives mistook them for a swarm of locusts.—The Rev. F. D. Morice showed photo-micrographs of the "saws" in ten British sawflies—species of the genus *Dolerus*. After briefly alluding to the specific characters presented by them, to certain points in which all alike differed from the ordinary tenon-saws employed by carpenters, he invited suggestions which might account for these differences. Might it be inferred, he asked, that

the insect's saw is made to cut, not like the carpenter's saw, by a *push*, but by a *pull*, and if so, is it because the latter movement involves less risk or damage to these delicate structures through bending or breakage? Again, what is the use of certain extremely fine denticulations on the teeth themselves, not at their apices? A discussion followed, in which Professor T. Hudson Beare supported, on the whole, the hypotheses suggested by the exhibitor. Dr. T. A. Chapman, however, was strongly of opinion that the name "saw" for these instruments, though well describing their general appearance, was misapplied as regards their function. They were really knives, all their cutting was done during the forward movement, the notches being merely a ratchet to hold one "saw" in place whilst the other advanced, as they alternately moved.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*December 10th, 1908*.—Mr. A. Sich, F.E.S., President, in the chair.—Dr. Hodgson exhibited a collection of Lepidoptera from North Queensland, including a fine series of *Papilio ulysses*, specimens of *P. sarpedon*, *Delias nigrina*, *D. nysa*, *Cethosia cydippe*, and several species of the brilliant genus *Danais*, *D. celestis*, *D. illustris*, and *D. sebæ*.—Mr. Harrison and Mr. Main, a bred series of *Ruralis betulæ*.—Mr. Newman, series of richly coloured specimens of *Saturnia pavonia (carpini)* from Kent.—Mr. Andrews, an ichneumon, *Bassus lætatorius*, female, which had been bred from a Syrphid, *Syrphus balteatus*.—Mr. Rayward, ova of *Tiliacea citrago* in situ on the scars of the leaf-stalk of lime, and which he had found by searching.—Mr. R. Adkin, a female specimen of *Agriades bellargus*, strongly marked with blue coloration, with complete absence of the usual orange lunules on the hind wings; and a bred series of *Melanippe tristata* from ova, showing scarcely any variability.—Mr. W. J. Kaye, Herr Niepelt's types of recently described forms of *Heliconius* from Ecuador, including *H. melpomene*, *aglaopa*, forms *isolda*, *rubripicta*, *adonides*, and *gisela*, *H. xenoclea*, *plesseni* forms *corona* and *diadema*, *H. erato*, *estrella* form *feyeri*, and *H. xenoclea*, *plesseni* form *niepelti*, and commented on this grand series of graduation forms.

January 14th, 1909.—The President in the chair.—Mr. Tonge exhibited enlarged photographs of several species of Lepidoptera at rest on tree-trunks.—Mr. Harrison Main, the results of the breeding of *Aplecta nebulosa* and its forms *robsoni* and *thompsoni*, to illustrate the remarks of Professor Bateson.—Mr. L. W. Newman, *Abraxas grossulariata* ab. *varleyata*, red and yellow forms of *Callimorpha dominula*, and type and melanic forms of *Ennomos autumnaria*, with notes on the results of breeding from selected specimens during the last three or four years.—Mr. R. Adkin captured and bred series of *Aspilates ochrearia (citraria)*, and gave details of the breeding and its results.—Professor Bateson, F.R.S., gave an address on "Mendelism," illustrating his remarks by numerous lantern slides.

January 20th.—The President in the chair. *Annual Meeting*: the Report of the Council stated that the Society had one hundred and sixty-eight members; that in addition to twenty-three meetings, seven field-meetings or visits to museums had been made; that six

long papers had been given; that the lantern was in frequent use; that both the library and collections were constantly being referred to; and that altogether another successful year's work had been recorded. The statement of the Treasurer showed a small balance in hand, with hopeful prospects for the coming year. The President, Mr. Sich, read the Annual Address, dealing, after the obituary and some general remarks upon the Society and the entomological items of interest during the year, with references to insects by writers of antiquity. The following is a list of Officers and Council for the ensuing year:—President: A. Sich, F.E.S.; Vice-Presidents: R. Adkin, F.E.S., W. J. Kaye, F.E.S.; Treasurer: T. W. Hall, F.E.S.; Librarian: A. W. Dods; Curator: W. West; Hon. Secretaries: Stanley Edwards, F.L.S., F.E.S. (Corres.), Hy. J. Turner, F.E.S. (Report). Council: S. R. Ashby, F.E.S.; E. C. Joy; A. M. Montgomery, F.E.S.; H. Main, B.Sc., F.E.S.; A. L. Rayward, F.E.S.; R. South, F.E.S.; and A. E. Tonge, F.E.S. *Ordinary Meeting*.—Mr. Buckston, on behalf of Mr. Baldwin, exhibited two males of *Anthrocera filipendulæ* in cop. with one female; a specimen of *Euchelia jacobææ* in which the red markings were very dull in tint; and an unusually dwarf example of *Polyommatus icarus*.—Mr. Rayward, dwarf specimens of *P. icarus*, *L. arion*, *Colias hyale*, and *Euchloë cardamines*, some captured and some bred, and made some remarks on the occurrence of this form of variation.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*November 16th, 1908*.—Mr. W. Mansbridge, Vice-President, in the chair.—Messrs. Harrison and Main kindly lent their excellent series of lantern slides, illustrating phases in the development of various interesting species of Lepidoptera and protective resemblance to resting surface, some very striking instances of this latter being shown. Mr. Taylor, of Bolton, also sent his series of slides, chiefly of Lepidoptera in their natural surroundings, and some slides of Lepidoptera taken by the Lumière direct colour process. Dr. Cotton, as well, showed photographs by the Lumière process of Lepidoptera and views in the gardens at Southport.—Mr. F. N. Pierce brought the long series of *Hydræcia nictitans*, *paludis*, *lucens*, and all the known specimens of *H. crinanensis*, being the material with which he, in collaboration with the Rev. C. R. N. Burrows, of Mucking, Essex, had worked out the specific distinctness of the four species by a study of the genitalia. Mr. Pierce described the differences of the genital appendages, and illustrated his remarks with a series of excellent photographs; he further pointed out how, without destroying the moth as a cabinet specimen, the species could be examined and recognized.

December 21st, 1908.—This was the Annual Meeting of the Society, held at the Royal Institution, Colquhoun Street, Liverpool, Mr. William Mansbridge, Vice-President, in the chair, and the following gentlemen were unanimously elected as the Council of the Society for the ensuing year:—President: S. J. Capper, F.E.S. Vice-Presidents: H. H. Corbett, M.R.C.S., Doncaster; Wm. Mansbridge, F.E.S.; E. R. Bankes, M.A., F.E.S., Corfe Castle; Robert Newstead,

M.Sc., F.E.S.; W. J. Lucas, B.A., F.E.S., Kingston-on-Thames
C. E. Stott. Treasurer: J. Cotton, M.R.C.S., F.E.S. Secretaries:
H. R. Sweeting, M.A.; Wm. Mansbridge. Librarian: F. N. Pierce,
F.E.S. Council: J. Collins, Oxford; R. Wilding; O. Whitaker;
Wm. Bell, M.R.C.S., J.P.; E. G. Bayford, F.E.S., Barnsley; P. F.
Tinne, M.A., M.B.; W. D. Harrison; W. A. Tyerman; E. J. B.
Sopp, F.R.Met.S., Wolverhampton; Wm. Webster, M.R.S.A.I.; Geo.
Arnold, F.E.S.; Wm. Mallinson. Mr. Oscar Whittaker read a paper
entitled "A Preliminary Catalogue of the Hemiptera-Homoptera of
Lancashire and Cheshire," and additions to "A Preliminary Cata-
logue of the Hemiptera-Heteroptera of Lancashire and Cheshire."

—Mr. George Arnold, F.E.S., read a paper entitled "Additions to
the List of Hymenoptera of Lancashire and Cheshire," and exhibited
the various species enumerated. Mr. Oscar Whittaker enumerated
specimens of *Stenocephalus agilis* and *Corixa affinis*, recently added
to the local list of Heteroptera.—Mr. F. N. Pierce exhibited a short
series of *Abraxas grossulariata*, and remarked on the small range of
variation shown by these specimens during the season of 1908.—
Mr. C. B. Williams exhibited a number of species of Lepidoptera
from Cambridge, including *Himera pennaria*, one brownish female
and one male irrorated with fuscous. *Asteroscopus sphinx*; a nice
series. *Cidaria miata*. *Xylina ornithopus*, and from Denbighshire,
North Wales. *Polia chi*, a nice series of the typical form. *Cloantha*
solidaginis, a nice series, closely agreeing with the West Riding form
in darkness of coloration. Mr. Williams also announced that a
specimen of *Acherontia atropos* had been captured in Birkenhead on
the 7th November last.—Mr. E. J. B. Sopp sent for exhibition a
specimen of the cricket *Gryllus bimaculatus*, which was found at the
Liverpool Docks in a fruit cargo from Spain.

January 18th, 1909.—Meeting held at the Royal Institution,
Colquitt Street, Liverpool, Mr. C. E. Stott, Vice-President, in the
chair.—Mr. W. Mansbridge, F.E.S., contributed a paper entitled
"Micro-Lepidoptera in Lancashire in 1907-8." The author gave
short notes on the habits, occurrence, and variation in the case of
insects freshly recorded by himself during the period mentioned,
and exhibited most of the species thus dealt with. *Pædisca nævana*
and *P. geminana* were bred last season from holly and bilberry respec-
tively; the genitalia of these were exhibited under the microscope
by Mr. F. N. Pierce, but no difference between them could be
observed, excepting the loss of certain fugitive hair-tufts by *P. gem-
inana*. The list given by Mr. Mansbridge included three species new
to the published lists.—Mr. F. N. Pierce showed a series of the
Carnende group of the Agrotidæ, including a small test collection
sent him by the Rev. C. R. N. Burrows, which had passed through
the hands of several experts, along with their comments. Mr. Pierce
stated that he had now been able to differentiate with perfect clear-
ness and consistency, by means of the genitalia, four of the species
in this group, namely, *cursoria*, *nigricans*, *obelisca*, and *triticti* and
aquilina. He also showed the genitalia of two specimens, and the
wing portions of one of them, which he believed would ultimately
prove either an unrecognized species or the true *aquilina*. Mr.
Pierce illustrated his remarks by preparations shown under the

microscope.—Mr. Stott exhibited a fine specimen of *A. atropos*, captured by Mr. S. Redford of Fleetwood, at electric light on Fleetwood promenade.—Mr. W. A. Tyerman brought a small collection of Lepidoptera, taken in the vicinity of Hong-Kong, which included *Attacus atlas*, *Papilio paris*, and many other showy species.—Mr. J. J. Richardson showed *Peronea mixtana* from Bidston Hill, Birkenhead.—H. R. SWEETING & WM. MANSBRIDGE, *Hon. Secs.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*December 1st.*—Dr. G. G. C. Hodgson exhibited an extensive series of *Lycæna ægon* from many localities, including male with two of the silver spots on one hind wing confluent.—Mr. F. M. Edelsten, ova of *Tapinostola fulva* laid in a curled leaf of *Carex paludosa*, Norfolk, September, 1908. Mr. Edelsten stated that the female appeared to be provided with a special organ for forcing apart the edges of the curled leaf.—Mr. F. Pennington, a series of *Lycæna corydon*, including fine examples of vars. *fowleri*, *striata*, and *melanotoxa*; also *Noctua plecta* with usual costal streak only extending half way from the base, and *Apamea oculatea* with pale coloration of reniform striated on surrounding nervures.—Mr. V. E. Shaw, *Satyrus janira*, Bexley, August, 1908, with left hind wing bleached save for small area at base.—Mr. L. W. Newman, *Abraxas grossulariata* entirely black with the exception of a small pale basal spot, bred from typical parents of *varleyata* female and typical male.

December 15th.—Mr. E. A. Cockayne exhibited *Sesia andreniformis* and its parasites *Bracon variator* and *Meniscus pemplator*; also stems of *Viburnum lantana*, showing various phases of larval borings, and the cap formed by the larva over the hole through which the imago ultimately emerges.—Dr. G. G. C. Hodgson, *Argynnis selene*, East Sussex, June, 1908, one showing a melanic tendency on marginal area of wings; another with similar tendency on basal half of wings; while a third specimen had the marginal half of the wings clouded with black broken up by fulvous dashes; in the latter specimen the under side was also abnormal.

January 5th, 1909.—Mr. H. M. Edelsten exhibited *Cidaria reticulata*, bred from Windermere pupæ.—Dr. G. G. C. Hodgson, *Cænonympha typhon* var. *rothliebi* from Witherslack, *Epinephele hyperanthus* var. *obsoleta* from various English and Scotch localities, and a series of *Cænonympha pamphilus*, including specimens with ocelli on upper side of fore wings obsolete.—Mr. A. W. Mera, *Deilephila livornica*, Torquay, 1906.—Mr. V. Shaw, *Polyommatus phlæas* abs., one with entirely black hind wings, Darenth Wood, July, 1908; the other with straw-coloured marginal band on left hind wing, Bexley, August, 1908.

January 19th.—Rev. C. R. N. Burrows, *Orgyia gonostigma* female with pale coloration of *antiqua* female; *Xylophasia polyodon*, a black example, Mucking, 1908; *Odonestis potatoria* var. *berolinensis* male; and ab. *intermedia* male, Mucking, 1908.—Mr. Leach, a series of *Calocampa exoleta*, Inches, N.B., October, 1908, varying from pale to dark suffused forms.—Mr. L. W. Newman, *Abraxas grossulariata* var. *varleyata*, part of second brood of thirty-one specimens, of which seven were *varleyata*; the brood was raised from typical parents,

themselves the progeny of *varleyata* and type.—Mr. V. E. Shaw, *Melanippe fluctuata* with the central band carried uniformly across the whole width of the upper wings, Bexley, 1908.—Mr. H. B. Williams, a gynandromorphous *Bupalus piniaria* with right-hand wings and antenna male, and left-hand wings and antenna female.—S. J. BELL, *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY. — *February 3rd*, 1909.—Mr. C. F. Johnson, F.E.S., President, in the chair.—The President referred to the great loss the Society had sustained through the death of Mr. L. Krah, who was a most successful collector and breeder of European moths, especially Noctuæ.—Mr. W. Mansbridge, F.E.S., read a paper—"Notes on *Gnophos obscuraria*," illustrated by specimens from various localities, showing the great range of colour, practically from black to white. He referred particularly to the white forms *calceata* and *mundata* from Lewes, and expressed the opinion that the latter would soon become extinct.—Mr. B. H. Crabtree, F.E.S., showed a fine banded form (*fasciata*) from Folkestone.—Mr. A. H. Davison exhibited a specimen of *P. ridens*, bred from a pupa taken at Timperley, Cheshire, the first record for the county.—Mr. A. J. Wilson, several species of Coleoptera and stick-insects from the East, and Mr. A. Wright, Micro-Lepidoptera from the Burnley District and from Silverdale.—A. W. BOYD, *Hon. Sec.*

RECENT LITERATURE.

A Natural History of the British Butterflies, their World-wide Variation and Geographical Distribution. A Text-book for Students and Collectors. By J. W. TUTT, F.E.S. Vol. ii. London: Elliot Stock. 1908.

"POPULAR" books upon "British Butterflies," turned out from the press at frequent intervals, with one or two notable exceptions, continue to repeat the errors of their predecessors, being no more than compilations, and destitute of original observations in any form or shape. Mr. Tutt, at all events, leaves no excuse for this particular class of vicarious writing and its worst absurdities, while the resumption of his 'Natural History of British Butterflies' will be welcomed by all who are able to appreciate the value of a comprehensive work upon a subject which has hitherto been treated by too many writers in a purely imitative spirit. The completion of the second volume, also, must have given food for reflection to a great many entomologists who have been put in possession, probably for the first time, of the real facts connected with the life-histories of the species enumerated. To none of us, perhaps, would it have seemed possible to collect and fill four hundred closely printed pages of demy octavo with details of our five "Hairstreaks," and a single "Blue," their varieties, aberrations, and congeners, and this chiefly the harvest of original observation. But this is what Mr. Tutt has done for us, to say nothing of the chapters devoted to hibernation and æstivation,

and the gregarious and family habits in butterfly larvæ. The body of volume ii., however, is given over to the British Ruralines (*Theclinae*) and *Celastrina* (*Cyaniris*) *argiolus*, with which most collectors are familiar enough in the imago state, and a first result of detailed attention to their earlier stages confirms the view that the heterogeneous classifications of previous authors—notably of Staudinger—can no longer be justified on a scientific basis. True, Mr. Tutt indulges in a kind of nomenclature that the older school will scarcely admire, and though his generic prefix for *w-album*—*Edwardsia*—is perforce superseded by *Chattendenia* in the pages containing “Corrigenda,” the further transformation will not reconcile sticklers for form and euphony. It remains for an Entomological Congress of the future, conducted on international lines, to give finality to such things. Meanwhile Mr. Tutt makes it abundantly clear that some of the “Linnean shibboleths” will have to be discarded as the natural consequence of the wider knowledge attained in no small degree by his own indefatigable patience and industry, although, as urged in his preface, we owe a first debt of gratitude to Scudder in this respect for light and leading on the right way—that is to say, in educating us to recognize the importance of observing the living object as compared with museum and cabinet research, which chiefly concerns itself with cataloguing and orderly arrangement, in accordance with convention and convenience, rather than scientific accuracy.

But, while Mr. Tutt has provided the biological student who desires to approach the subject in a serious spirit with much solid material, he expresses himself in language which can be understood and enjoyed by that larger audience to whom natural history appeals as no more than a pleasant holiday for the mind. That, in our opinion, is the charm of Mr. Tutt’s writing. An experienced and keen worker in the field, he is careful to avoid the dry-as-dust phraseology and treatment which so often discourages and repels; he is not above the inclusion of those “purple patches” which give colour and variety to highly technical subjects; into the library he imports the genial gleam of woodland, down, and heath, with which our interesting butterfly fauna is associated. If anything, the sections which include locality and habitat are treated too diffusely in the case of common insects, and some quite unnecessary repetitions might have been avoided. But in the case of our rarer species, for good and obvious reasons, we are not sorry that county records are often vague and of ancient date. Those who are in the field for purely scientific purposes will never, we imagine, have the least difficulty in getting such information as they require for legitimate purposes from their friends and colleagues.

Again, there is a refreshing absence of insularity throughout these pages. Assisted materially by the discoveries of Dr. Chapman, Mr. Bethune-Baker, and others, Mr. Tutt is able to announce even in this single volume the identity of several ranked species, especially in the wide-ranging genus *Celastrina* (*Cyaniris*); while, in the parts of volume iii. already to hand, he has established a similar state of things in the several forms of *Everes*, hitherto separated as distinct in the Nearctic and Palæarctic regions. With the admirable photomicrographic plates by Mr. F. Noad Clark, and Mr. H. Main, before us,

we can gather from the illustrations of the complex structures of ova, larvæ, pupæ, and imagines thus revealed, precisely how these results have been attained. We are also able to follow the author's chain of reasoning as it leads up to the establishment of species based upon sound scientific differentiation, discarding mere superficial marking of the wings and the external similitude of one particular stage of development, and drawing final conclusions from a review made of the whole life-history of each individual, now presented in complete sequence for the first time. The discovery of separation of species by the character of their appendages knocked on the head some old-established theories as to what constituted a species in Lepidoptera. Mr. Tutt goes further, and in the process of assigning these one or two species their proper place in the scheme of butterfly classification carries his anatomical investigations far beyond anything of the kind already attempted. We feel quite sure, therefore, that whatever affinities exist, and whatever further light may be thrown on this difficult subject, no conscientious systematist will ever again return to the easy methods complacently accepted by British and Continental authors. Mr. Tutt, we are certain, would be the first to acknowledge how large a share of the credit for this is due to those who have exerted themselves for him, and under his instructions. Yet we would remind our readers that it is only by cordial co-operation among British lepidopterists, whether engaged with biological problems or with the pleasures of field natural history, that this classic series can ever be completed. We have, indeed, comparatively few British butterflies, but those we have offer a wide field for research, still in many cases wholly unexplored. Those who are endeavouring to do this pioneer work ought to be encouraged, and we trust that the public libraries, and Natural History Societies throughout the United Kingdom will come forward to support an enterprise which should not be left to private subscription only.

H. R.-B.

Catalogue Systématique et Biologique des Hyménoptères de France.

Par JULES DE GAULLE, Membre de la Société Entomologique de France. Pp. 171. With Introduction and Index of Genera, Plant-names, and Host-names. Paris: Paul Klincksieck, 3, Rue Corneille. 1908. [Extrait de la 'Feuille des Jeunes Naturalistes,' 1906-8.]

As the author of the present work very truly says, it certainly is of very considerable use to supplant the hymenopterous 'Catalogue' published by Dours in 1874 by a fresh one, bringing up to date in a concise form all that has been done in France upon the Hymenoptera during the past quarter of a century. And, indeed, when we compare the two, we get as good a conspectus as is anywhere obtainable of what the last twenty-five years has produced. Our friend M. de Gaulle pretends to no novel classification, but freely avows that he follows Dalla Torre, except where the latter has been elaborated by the subsequent works of André, Berthoumieu, Rev. T. A. Marshall, Du Buysson, the late Pastor Konow, and, unfortunately, of Kieffer. Perhaps it had been better in a few instances, such as the specific

ingredients of the genera *Barichneumon* and *Cratichneumon* which are much intermingled, if he had not so closely followed the second author cited, and a great many of Förster's genera, given by Dalla Torre, are most unnatural ones; but it is a systematist's duty to include all the divisions erected, though subsequent writers are fortunately at liberty to ignore them, if found invalid. Particularly in the *Pezomachoid* subgenera is this the case, since these sections are founded entirely upon alar development, of no stability in these groups; and one is led to think *Pezomachus* itself but poorly represented by thirty-four species, though many more can now be added, since we have ourself seen several species in M. de Gaulle's collection, not herein included. The grouping of the *Pimplini* genera is somewhat novel, though it is in no way to be condemned; and many of those among the *Mesoleptini* might have been dispensed with to greater advantage, especially the *Försteran*, though that author's really useful *Alloplasta* has not been employed for *Meniscus murinus*, Grav. The *Braconids* follow Marshall's arrangement in André's great work, with various doubtful improvements from Szeplegeti in 'Genera Insectorum.' The list is a full one, though it is surprising to find but forty-two species of *Apanteles* enumerated: seventy-three are British. France has evidently paid a great deal more attention to her *Chalcididae* than Britain of late. The catalogue is not extensive, though very instructive, comparing favourably with that of our own species recently presented for publication to the Entomological Society of London by Mr. Claude Morley, which comprises over fourteen hundred species. It is, however, quite otherwise with the *Chrysid*s, *Ants*, and, in fact, all the *Aculeata*; and one is led to speculate upon our insular dearth of these things. The author has conferred one real boon upon all systematists in distinctly intimating such "species" as are mere MS. names, both in Dours' 'Catalogue' and in Dr. Giraud's very excellent "Liste des éclosions d'Insectes" (Ann. Soc. Fr. 1877, pp. 397-436). Another is the addition of food-plants in the phytophagous, and host-names in the parasitic, species; as well as the establishment of the synonymy of names in Fourcroy's 'Entomologia Parisiensis' and De Fonscolombe's 'Ichneumonologie Provinciale' of 1847 to 1854. M. de Gaulle, in a post-scriptum, requests that all additions to the French fauna and suggestions for the good of the Catalogue be sent him. We can do no more than return our thanks for an exceedingly valuable and laborious list, and venture to note that there is no summary of the exact number of species in the various families, subfamilies, and tribes enumerated. The total is said to approximate five thousand species, one comparing most favourably with the two thousand six hundred of the old Catalogue, though the total is suspected of reaching eight thousand when full investigation of France's Hymenoptera has been achieved.

C. M.

Annals of Tropical Medicine and Parasitology. Vol. ii, No. 4.
 Liverpool School of Tropical Medicine.

AMONG the contents are "A new Culicid Genus," by F. V. Theobald, M.A.; and "Note sur le rôle des Tabanides dans la Propagation des Trypanosomiasés" par Le Dr. Edmond Sergent.

Ichneumonologia Britannica, iii. The Ichneumons of Great Britain; a Descriptive Account of the Families, Genera, and Species indigenous to the British Isles, together with notes as to Classification, Localities, Habitats, Hosts, &c. By CLAUDE MORLEY, F.E.S. Pp. i-xvi, 1-328. H. & W. Brown, 20, Fulham Road, London, S.W. 1908.

THE third volume of Mr. Morley's valuable work on our parasitic flies was published at the end of November last; it deals with the third great subfamily, the Pimplinæ, which, as the author states, is probably better known than any of the others on account of the large size and interesting economy of many of the species belonging to it. Two hundred and eleven species are included in the subfamily, and these are divided up into the following five tribes:—

Xoridides (8 genera, 15 species); Pimplides (12 genera, 106 species); Lissonotides (9 genera, 62 species); Acænitides (8 genera, 13 species); and Banchides (2 genera, 15 species).

The Xoridides prey chiefly on wood-feeding Coleoptera and Hymenoptera. The majority of the Pimplides affect lepidopterous or hymenopterous larvæ—at least one attacks the nest of the mason wasp, and a few destroy spiders or their eggs. Lissonotides are mainly associated with Lepidoptera, and rarely with Coleoptera. Of the Acænitides the hosts are but little known, and so far as has been ascertained seem to be parasitic, as are the Banchides, on Lepidoptera.

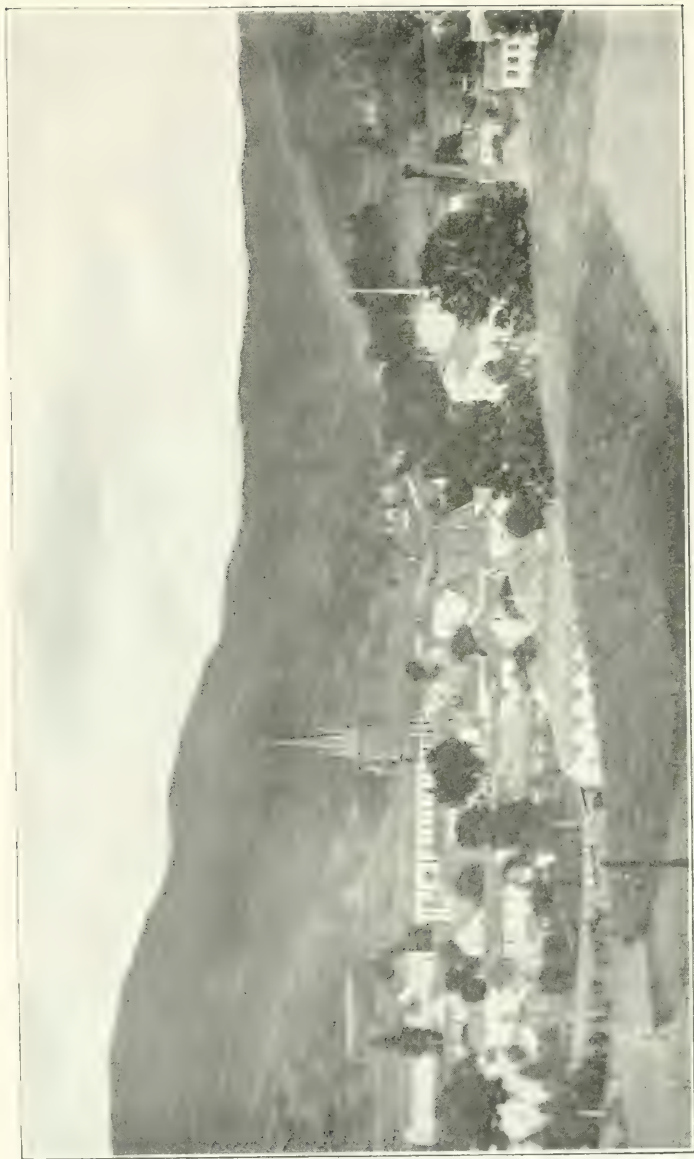
The present volume is in every way quite up to the standard of the first one, which we had the pleasure of noticing some five years ago (*Entom.* xxxvii. p. 52). As we then remarked, parasitical flies are well known to the rearer of Lepidoptera. How few of us, however, seem to recognize the possibility of the destroyer of our hopes being some rare or little-known species of ichneumon.

Transactions of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne. (New Series.) Vol. iii, part i. Pp. 1-222, and i-xxvii. London: Williams & Norgate. Newcastle: Mawson, Swan & Morgan, Ltd. 1908.

THE part contains, among other papers of interest, two upon entomological subjects. One of these, by Richard S. Bagnall, treats of new Genera and Species of Thysanoptera; it occupies pp. 183-217, and is accompanied by two well executed plates. The other is part ii. of a paper entitled "Catalogue of Butterflies collected in Burmah," by Lt.-Col. C. H. E. Adamson (pp. 116-148). A paper "On some Rare Arachnids captured during 1907," by A. Randell Jackson, M.B., may also be mentioned.

Twelfth Report of the State Entomologist of Minnesota for the Years 1907-1908. By F. L. WASHBURN. Pp. i-x, and 1-205.

DEALS with numerous insect pests, and the methods employed to check their ravages.



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And the Vallée des Chatbonniers.

A. E. G.

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FIVE WEEKS IN THE VOSGES.

BY A. E. GIBBS, F.L.S.

(PLATE III.)

WHEN travelling down the Rhine Valley from Strassburg to Mülhousen a few years ago, I noticed from the carriage window on the right the long line of castle-crowned peaks of the "blue Alsatian mountains," a delightful looking country which appeared to be well worth a visit, and I determined on some future occasion to explore this tempting region. These hills form the Vosges range of Alsace and Lorraine, on the border-land of France and Germany, and across their highest peaks runs the boundary line, the scientific frontier which Bismark insisted on at the close of the war of 1870. In turning over in my mind last winter possible schemes for an entomological holiday on the Continent, not so remote from home as to make the journey too exhausting for the younger members of the party, I thought of resolves made in bygone days. So we made a hasty tour at Easter, when the hills were covered with snow and the cold was intense, to spy out the land, and to find a comfortable hotel for a few weeks' sojourn, in a centre which appeared promising from an entomological as well as a scenic point of view, with the result that we selected the village of St. Maurice-sur-Moselle at the south-west corner of the range, on French territory, as our headquarters, a choice which we afterwards found no reason to regret. St. Maurice is an industrial village of about three thousand inhabitants, situated at an altitude of 1824 ft. above sea-level, and is reached from Paris by way of Nancy and Epinal. Arriving in the evening of June 27th we found comfortable rooms had been reserved for us in the Hotel de la Gare, where Mons. Cuny, the landlord, and his good wife proved most assiduous and attentive. The next morning broke delightfully and we were astir betimes. While breakfast was being prepared under the shade of the lime tree, whose fragrant blossoms were being picked to be dried to mix with the tea, or what passes for tea in

eastern France, we got our first experiences with the butterflies of the region, by capturing *Pararge mæra* and *Aporia crataegi* which were flying in the hotel garden. Both were worn, the latter especially having seen its best days, though dilapidated females were to be met with for several weeks after this date; in fact the insect was on the wing during the whole time we were at St. Maurice. Mr. P. J. Barraud had travelled with us from Paris and remained for about a fortnight, during which time we made many pleasant excursions together. After breakfast we set out to explore the hills at the back of the hotel. Hardly had we crossed the little footbridge which spans the Moselle than I took a very fresh *Carcharodus althææ*, the only one seen during our visit. A number of specimens of *Rusticus argus* (*ægon*) were secured, a species which proved to be common in the district. On a piece of waste ground near by and in the meadows which were being mowed, *Erebia stygne* was flying, but was already getting over, and we found it difficult to pick out good specimens. Proceeding up the mountain side and capturing an occasional *Melitæa athalia* and *M. parthenie*, we saw a bigger fritillary which Mr. Barraud captured. It proved to be *Argynnis niobe* var. *eris*, and higher up the hill several others were taken. *Melanargia galatea* was well represented and in excellent condition, and the same may be said for *Lycæna arion*, some boldly-marked forms of which were obtained during our stay in the Vosges. Several beautiful specimens of *Chrysophanus alciphron* (type) rewarded a rough scramble. In the afternoon we again crossed the river and worked lower down the valley. Near the bridge my companion suddenly plunged into the brambles on the river bank and returned with a beautiful specimen of *Limenitis camilla* in his net, and a few minutes afterwards two others fell to my lot. *Polygonia c-album* was sporting in the bushes by the roadside, and an amorous pair allowed themselves to be caught without much trouble. In a bushy place on the edge of a wood *Argynnis adippe* was to be seen in first-class order. On the whole our first day's bag was a most encouraging one. Tempted by our successes we again visited the same hillside the next morning, but working up to a higher level, spending most of the time on the margin of the fir forest which crowned the summit of the mountain. On the way up, when climbing a steep grassy declivity, Mr. Barraud netted a specimen of *Papilio podalirius*, but it escaped, and although it came my way I had no better luck. This was unfortunate, as we did not again see this attractive species. The four larger Argynnisids—*paphia*, *aglaia*, *adippe* (with its var. *cleodoxa*) and *niobe* (mostly var. *eris*)—were abundant; a few *Brenthis selene* were seen; the Melitæas were *athalia*, *dictynna* and *parthenie*, while *Lycæna arion* flew about everywhere. After lunch we determined to try our fortunes on the opposite side of the valley. On the high road *Pararge mæra*

was much in evidence, sunning itself on the walls and rocks, but it was so battered and torn that it was not possible to find specimens of cabinet rank, and we had to defer the capture of a series until we visited the summits of the mountains, where it was in more presentable condition. *Issoria lathonia*, after the manner of its kind, was seen to settle on the dusty road and fell a prey to the net. Crossing some marshy meadows below the forester's house on the Plain du Canon, *Brenthis ino* was found flying among the more plentiful *Melitæa athalia*. *Eugonia polychloros* was first taken on June 29th, and July 1st we visited the lower slopes of the Ballon de Servance, a locality which proved afterwards to be our most prolific hunting-ground. On an uncultivated piece of hillside, where the children were busy picking whortleberries, we first made acquaintance with *Erebia ligea*, each of us catching two of them. This insect was subsequently found flying in sunny places at all elevations above the meadows which extend up to the forest zone, and also on the open summits of the higher mountains.

In the southern section of the Vosges are found the most lofty peaks in the range, rising to a height of four or five thousand feet, the average altitude of the hills being about three thousand feet. These high points are called Ballons. Towering above St. Maurice are two of the most important of these forest-clad heights. The huge granitic mass of the Ballon de Servance, projecting into the valley and forcing the Moselle to turn north westwards almost at a right angle, rises boldly above the village and forms a watershed, the drainage on the one side being generally northwards through the Moselle and other tributaries of the Rhine into the North Sea, while on the opposite side of the divide the streams flow southward to the Mediterranean. There are forests of beech and fir on the slopes, and above them rise the rounded grassy summits almost bare of trees or bushes, the haunt of *Erebia stygne* and *E. ligea*. On July 2nd we took advantage of a motor car which runs from the station to the hotel near the summit of the Ballon d'Alsace. Arriving soon after ten we started to climb to the highest point, across which runs the frontier line. Hundreds of *E. stygne*, mostly in first-class condition, were flying in the grass despite the strong wind which was blowing, and a very good series was soon secured. A fine male *iris*, scudding along with the wind at a great pace, was taken by me on the French side of the frontier line, and while I was busy with it Mr. Barraud took a fresh female of *Limenitis populi* var. *tremulæ*. Subsequently I chased what I believed to be *L. populi* at Charmes on July 30th, but as I did not succeed in catching it that locality must not be recorded. After lunch the wind dropped a little, and we spent some time in a sheltered

valley, where on the sides of a streamlet, *Brenthis selene*, apparently only recently out of the chrysalis, and one rather worn *B. euphrosyne* were sporting among the wild flowers, while *Limenitis camilla* was netted flying round a bush. Returning to the hotel for lunch several fresh specimens of *Gonepteryx rhamni* and some bright *Vanessa urticae* were secured. I did not again visit the summit of the Ballon d'Alsace until July 26th, by which time *Erebia stygne* had knocked itself to pieces, and *E. ligea* had taken its place as the most abundant butterfly. On this occasion a freshly-emerged female *Parnassius apollo* was found at rest on a flower-head on a steep slope just below the statue to the Virgin, which has been erected on the highest point. On July 4th, Mr. Barraud and I paid a visit to Wesserling, a German town, which was reached by coach from Bussang at the head of the St. Maurice valley. At the top of the col, at an altitude of 2410 ft., the road passes through a tunnel, and we emerge in German territory. A characteristic feature of the Vosges range is that on the western slope the descent to the level of the plains is gradual, whereas on the eastern side the declivity is very abrupt. This is well seen on the ride to Wesserling, and we ran quickly down the steep gradients to our destination. We had only about a hour's collecting at Wesserling, but it proved to be very remunerative. Crossing the railway near the station we ascended a wooded hill and were soon busy. Never, I think, have I seen such an abundance of butterflies, especially of *Argynnis paphia*, which was present in countless numbers on every bramble bush. Here we got ten specimens of *Brenthis daphne*, of which Mr. Barraud had met with a single example at St. Maurice on July 3rd. *L. camilla*, *I. lathonia*, *A. adippe* and its var. *cleodoxa*, *M. didyma*, and *M. galatea* were among the species taken. We were experiencing perfect weather, and the next day we determined to ascend the Ballon de Servance. The path led past the spot where a few days before we had discovered *E. ligea* and close by Mr. Barraud found *Hipparchia semele*, having lower down taken the first specimen of the season of *Leptosia sinapis*. Crossing the heathy slope where the commoner blues and fritillaries were sporting in the sunshine, the way next traversed the dense pine forest, where no sign of winged life was to be seen, but after a stiff climb through the gloom we emerged into a sunny meadow, where we were soon hard at work taking among other things some rather worn specimens of *Chrysophanus hippothoe*. Another short walk through the forest brought us on to the military road leading to the fort on the summit. A flowery space among the young fir trees was spied, which proved to be a veritable "butterfly corner," and where we afterwards spent many pleasant moments in the company of *Vanessa io*, *V. urticae*, *Polygonia c-album*, *Erebia ligea*, *E. stygne*, *Issoria lathonia*, *Pararge mæra*, *Argynnis paphia*, *A. adippe*, *A. aglaia*,

Brenthis ino, *Melitæa dictynna*, *M. didyma*, *M. athalia*, &c.—more pleasant perhaps for us than for the butterflies. We lingered all too long in this attractive spot, for there was still a stiff climb to the summit, and the way again led through the forest. By the time we had gained the top and were within sight of the fort, the sky had clouded over and rain soon began to fall. We tramped through the damp grass, turning out *Erebia stygne* in abundance, but little else, and the weather becoming worse we had to seek such shelter as the rocks afforded. However, we persevered, and after a time it cleared up sufficiently for us to explore a tempting looking valley, into the depths of which we scrambled, down precipitous slopes, pushing our way through the bushes, and at last arriving at the swampy ground at bottom, which had allured us to the venturesome descent. Our exertions were, however, without reward, for there was nothing to be found worth catching, and having rested long enough to eat our lunch and feast on the wild fruits, we succeeded in finding a woodman's path which led us to the summit again. The walk back to St. Maurice yielded nothing fresh, but we had done a good day's work and added three species to our list—*L. sinapis*, *P. semele*, and *V. io*. On the following morning a visit was paid to the Vallée des Charbonniers, where the bag included a very nice pale aberration of *I. lathonia*, and in the afternoon I climbed the hill at the back of the hotel and found *Brenthis dia* sporting in considerable numbers among the bracken, enjoying the last brief moments of sunshine before the Monarch of the Day sank behind the mountain and left the hillside in shadow.

On Tuesday, July 7th, we decided to go a little further afield, and leaving St. Maurice by the seven o'clock train arrived about an hour later at Remiremont, whence a steam tramway runs among the hills to Gerardmer. Our destination was Le Tholy, in the valley of the Cleurie. It is a small village with a cotton mill, and is a great centre of the cheese-making industry. There is a little hotel on the mountain above the station, and on our way up a magnificent female *Limenitis camilla*, surely one of the loveliest of insects, was secured. A few minutes later *Cænonympha arcana* was taken at rest on a blossom, and on the edge of a piece of woodland Mr. Barraud netted a male *Apatura iris*. Another record for the day was *Thecla ilicis* var. *cerri*, of which some four or five worn specimens appeared. After lunch a walk on the other side of the valley resulted in two more *L. camilla*, and among less noteworthy things a dwarf *Melanargia galatea*, but more curious still was a minute *Lycæna arion*, measuring only twenty-eight mm., which Mr. Barraud captured.

(To be continued.)

FOUR NEW SPECIES OF THE GENUS *ERETMAPODITES* (THEOBALD) FROM ASHANTI.

BY W. M. GRAHAM, M.B.,

Director Medical Research Institute, Lagos.

THESE four new species of the genus *Eretmapodites* are forest mosquitoes. They frequent shady forest paths where there are trees overhead, and where the ground is not quite bare of vegetation. They are sometimes found perching on low bushes, but are usually nearer the ground.

Numbers 3 and 4 are the commoner species, and can be found almost anywhere in the shady forest from May to January.

I have reared females of No. 3 from larvæ taken from a hole full of a decoction of dead leaves in the root of a forest tree. I have caught the female adult on the flowers of the wild pineapple.

All four species, in the resting attitude, carry the third pair of legs curved forward over the thorax; I have not seen them bite. They were taken at Obuasi and Kumasi.

Two other species, *E. quinquevittata* and *E. austenii*, have been described by Theobald, and another, *E. inornatus*, by Newstead, all from Africa.

A. Pale species; head covered mostly with parti-coloured flat scales. Prothoracic lobes covered with narrow, curved scales.

1. Hind tarsi of male "paddled," of female normal, black *oidipodeios*, n. sp.

2. Hind tarsi of male and female normal, last two joints white *leucopous*, n. sp.

B. Darker species, with more unicoloured flat scales on the head. Prothoracic lobes covered with flat scales.

3. Hind tarsi of male feathered, venter of female golden *chrysogaster*, n. sp.

4. Hind tarsi of male normal, venter of female black and white *melanopous*, n. sp.

1. *Eretmapodites oidipodeios*, nov. sp.

♂. The head is covered in front with dense parti-coloured (blue and white) flat scales, which project between the eyes and clothe the sides of the head, and in a triangular area behind with golden, narrow-curved and black upright and golden upright forked scales. Six long dark bristles project forward between the eyes, and posterior to them are three lateral bristles on each side of the head.

Antennæ: Plumose, the verticillate hairs pale brown. The two apical segments three times as long as the others.

Palpi: Thin, acuminate, black, without plumose hairs, shorter than proboscis.

Proboscis: Long, thin, blue-black, curved apically.

Clypeus: Dark brown, nude.

Thorax: The mesonotum is covered with narrow-curved scales. The ground colour is orange, covered in the greater part by black scales. Two parallel narrow bands, of golden scales run backwards for about three-fourths of the length of the mesonotum, enclosing between them a median black band of equal breadth. Behind, the black median band is continued to the scutellum by a short band of golden scales. Laterally there are two curved bands of golden scales, which reach the hind margin just external to the lateral lobes of the scutellum. An interrupted border of golden scales surrounds the mesonotum. Two tufts of long hairs project backwards above the wing-joints.

Scutellum: The central lobe is covered with blue and white parti-coloured flat scales, almost surrounded by purple flat scales, and on the edge are four long bristles and five smaller ones. The lateral lobes are covered with golden, narrow-curved and black, narrow-curved scales, and show three long bristles and some shorter ones.

Pleura: The pleura is a pale golden colour, with two closely approximated spots of blue and white flat scales below the wing-point, one on the mesopleura and one on the metapleura, with a third smaller spot lower down on the mesopleura. The prothoracic lobes are covered with narrow-curved, golden and a few black scales. There are some bristles on the edge, and below on the expanded tip of the prosternum there is a patch of blue and white flat scales.

Halteres: Base pale cream, part of the stalk and the knob covered with blue-black scales.

Metanotum: A dark golden colour, with five hairs and a few golden, narrow-curved scales at the apex.

Abdomen: A velvety black, with purple reflections, the venter banded with basal white bands, which become oblique laterally and become apical on the sixth segment. There is a dorsal white band on the seventh segment. The abdomen is compressed laterally and expanded posteriorly.

Legs: A purple-black, with narrow apical pale bands on the femora of the third pair. The hind tarsi are of abnormal form and densely plumed. The fourth segment is at right angles to the third segment, and is curved. The fifth segment is as long as the fourth, and nearly straight. Long pale brown hairs hang from the distal extremity of the third segment, and the fourth and fifth segments are feathered on both sides with long pale brown hairs, those on the fourth being almost at right angles to those on the fifth segment.

Ungues: I have not been able to spare a male for dissection.

Wings: Clothed along the costa with blue-black flat scales, with a metallic lustre, and elsewhere with dark-ribbed Trichoprosopon-like scales. The first submarginal cell is narrower and one-third of its length longer than the second posterior cell. The stem of the first submarginal more than half the length of the cell. The supernumerary and mid cross-veins are close together, and the posterior cross-vein about its own length nearer the base of the wing. The sixth vein turns at right angles to the costa just before its termination. There are a few blunt flat scales on the alulae.

Genitalia: The basal lobes are a long oval, with long curved claspers without terminal articulated spines, and covered on the basal half with flat scales, and on the distal half with some bristles. Very long, golden, stiff hairs clothe the basal lobes and project between them. I have not had material for a dissection.

Length: 4 mm.

♀. Head as in male. Antennæ less plumose. Palpi: Rather long, densely scaled, acuminate, black. Proboscis, thorax, metanotum: As in male.

Abdomen: The dorsum and sides are a velvety black, with broad oblique lateral white bands, basal on the proximal segments and apical on the sixth segment. The venter is pale gold, with apical black bands on the third, fourth, fifth, sixth, and seventh segments.

Legs: As in male, but the pale band on the hind femora is white. The hind tarsi are of normal form.

Wings: As in male. First submarginal one-third longer than second posterior, and stem of first submarginal half the length of the cell. Cross-veins as in male.

Length: 5 mm.

Habitat. Obuasi, in bush-paths, 2 p.m. to 5 p.m., in August, October, and November.

2. *Eretmapodites leucopous*, nov. sp.

♂. Head as in No. 1, but the scales are less blue. Antennæ, palpi, proboscis, clypeus: As in No. 1. Thorax: Very similar to that of No. 1.

Prothoracic lobes, pleuræ, halteres, scutellum, metanotum: As in No. 1.

Abdomen: Very similar to that of No. 1. A velvety black, with broad bands of white basal banding on the venter; these bands become oblique laterally, and apical on the sixth segment and dorsal on the seventh segment, but do not meet in the middle line dorsally. There are golden ventral spots on the sixth and seventh segments. Abdomen is compressed laterally and flattened and expanded towards the extremity.

Legs: As in No. 1, but the two last segments of the tarsi are pure white and of normal form.

Wings: Colour and scales very similar to those of No. 1. First submarginal cell one-third of its length longer than the second posterior cell. The stem of the first submarginal more than half as long as the cell. All these cross-veins are close together. Sixth vein turns at right angles to costa at its extremity.

Genitalia: Externally very similar to No. 1.

Length: 4 mm.

♀. Head as in male. Antennæ: The verticillate hairs are shorter and less numerous.

Palpi: Very short, and less densely scaled than in No. 1.

Proboscis and clypeus, pleuræ and prothoracic lobes, thorax and scutellum, and halteres: As in male.

Abdomen: The venter a pale golden colour, with brown apical

bands on the fourth, fifth, and sixth segments. The dorsum and sides are velvety black, with oblique white basal lateral bands, becoming apical on the sixth and seventh segments. Abdomen narrowed towards its extremity. Legs and tarsi: As in male.

Wings: First submarginal cell more than one-third of its length longer than the second posterior. The stem of the first submarginal is less than half the length of the cell. The supernumerary and mid cross-veins are close together; the posterior cross-vein about its own length towards the base of the wing. Sixth vein as in male.

Length: 4 mm.

Habitat. Obuasi and Kumasi, in bush; August to November at Obuasi, 11 a.m. to 1 p.m.; October, Kumasi, 11 p.m.

(To be continued.)

CURRENT NOTES.

By G. W. KIRKALDY.

1. REUTER, O. M.: "Charakteristik und Entwicklungsgeschichte der Hemipteren-Fauna (Heteroptera, Auchenorrhyncha, und Psyllidæ) der Palaearktischen Coniferen," Act. Soc. Sci. Fenn. xxxvi. no. 1, pp. 1-129 (1908).
2. DISTANT, W. L.: "Rhynchota, vol. iv." Fauna of British India Series, pp. 1-501, text figs. 1-282. [Hemiptera.]
3. GILLETTE, C. P. and TAYLOR, E. P.: "A few Orchard Plant Lice," Bull. Colorado Exp. Sta. 133, pp. 1-48, pls. 1-4 (September, 1908). [Hemiptera.]
4. GUILBEAU, B. H.: "The Origin and Formation of the Froth in Spittle Insects," Amer. Nat. xlii. 783-98, figs. 1-8 (December, 1908). [Hemiptera.]
5. FELT and others: "Twenty-third Report of the State Entomologist of New York," Educ. Dept. Bull. no. 433 (Mus. Bull. 124), pp. 1-541, text figs. 1-49, pls. 1-44, and two text maps.
6. DOANE, R. W.: "Variations in the Wing-venation in some Tipulidæ," Ent. News, xix. 405-7, pl. xvii. (November, 1908). [Diptera.]
7. PREBLE, E. A.: "A Biological Investigation of the Athabaska-Mackenzie Region," North Amer. Fauna, no. 27, pp. 1-574, pls. i.-xxv. text figs. 1-16 (October 26th, 1908).
8. SOAR, C. D.: "The Genus *Hydrachna*," Journ. Quekett Micr. Club (2), x. 271-82, pl. 21 (November, 1908). [Arachnida.]
9. WESCHE, W.: "The Proboscis of the Blowfly, *Calliphora erythrocephala*, Mg.—a Study in Evolution," *op. cit.* 283-94, pls. 22-23. [Diptera.]

10. WHITE, G. F.: "The Relation of the Etiology (Cause) of Bee Diseases to the Treatment," Bull. U. S. Ent. 75, pp. 31-42 (December 26th, 1908).
11. AURIVILIUS, C.: "Hymenoptera I. Gaddsteklar. Aculeata. Sjunde Familjen. Vågsteklar. Pompilidæ," Ent. Tidskr. xxviii. 1-30, figs. 87-110 (April 25th, 1907).
12. LAMPA, S.: "Om Oxstynget (*Hypoderma bovis*, DG.)," *op. cit.* 65-72, pl. i. text figs. 1-2 (September 28th, 1907). [Diptera.]
13. WAHLGREN, E.: "Svenska Siphonaptera," *op. cit.* 85-91, figs. 1-2 (September 28th).
14. ID.: "Diptera I. Första Underordningen. Orthorapha. Andra Gruppen Fulgor. Brachycera. Fam. 14-23," *op. cit.* 129-91, figs. 1-25 (September 28th).

There is nothing, apparently, entomological in the "Biological Investigation of the Athabaska-Mackenzie Region," but the work will be indispensable to any entomologist studying the region, whose physical geography, life-zones, vertebrata, botany, and history are exhaustively considered (7), a bibliography and index being added. It is supplementary to the previous report on the Hudson Bay Region (1902, North American Fauna, no. 22).

The Twenty-third New York Report is the bulkiest of the series, and contains much matter of interest and importance to the systematist as well as to the biologist (5). The principal paper is Needham's "Report on the Aquatic Work done during 1905" (pp. 156-248, text figs. 2-16, pls. 4-32, and 2 text maps), containing a new classification of the Tipulidæ; there are also extensive notes on the Odonata. Among the other contributions are Chadwick's "Catalogue of the Phytoptid Galls of North America" (pp. 118-55); O. S. Thomson's "Discussion of the Male Genitalia in Odonata" (pp. 249-63, text figs. 17-28); and Felt's "Further Work on the Cecidomyiidae" (pp. 286-422, text figs. 29-49, pls. 33-44).

Reuter has treated in the fullest manner the Palearctic Hemiptera of the Coniferæ (1). The enumeration and discussion of the species are accompanied by a very extensive bibliography. Guilbeau (4) has discussed the origin of froth in Cercopid nymphs. He says that the secretion is made up from two sources. The fluid portion is the anal secretion into which the insect by means of the caudal appendages introduces numerous air-bubbles; the glands of Batelli secrete a mucilaginous substance, which, added to the former, renders it viscous, and causes the retention of the air-bubbles. Distant (2) has completed his preliminary account of the Indo-Ceylonese Hemiptera. The work will be useful for the two hundred and eighty-two figures, many of the genera being figured for the first time. Gillette and Taylor (3) discuss at some length some orchard

aphids, and illustrate them with well-coloured plates. Eight of these aphids are also European.

Aurivilius (11) and Wahlgren (13 & 14) have treated of certain Swedish insect groups; their papers should be of considerable interest to British workers.

The titles of the other papers enumerated are self-explanatory (6, 8, 9, 10, 12).

DESCRIPTION OF A NEW CICADA FROM CENTRAL CHINA.

By W. L. DISTANT.

Fam. CICADIDÆ.

Subfam. GÆANINÆ.

TAONA, gen. nov.

Head, including eyes, about as wide as base of mesonotum and as long as pronotum, the front not obliquely deflected but horizontally produced in front of and a little below the anterior margin of the vertex; ocelli somewhat close together near middle of vertex; face prominent, somewhat compressed, strongly transversely ridged; clypeus strongly compressed and reaching the anterior coxæ; pronotum about as long as mesonotum, its lateral margins nearly straight; rostrum reaching the posterior coxæ; anterior femora strongly spined beneath; tegmina and wings opaque, tegmina with their greatest breadth more than one-third their length, apical areas eight, the apical margin oblique, the apex subangulate.

Intermediate between *Gæana* and *Balinta*, allied to the first by the broader tegmina, but differing by the shorter head, which allies it to *Balinta*, from which, however, it is separated by the short and broad tegmina, and the non-deflected head in front of eyes; the compressed face somewhat straightly continued to clypeus is also distinctive. I have not seen a male specimen, so cannot describe the opercula.

Taona versicolor, sp. n.

♀. Head, pronotum, mesonotum, head beneath, sternum, legs and tegmina virescent; eyes, apices of tibiae, tarsi and costal membrane of tegmina more or less pale testaceous-brown, the veins on basal area of tegmina fuscous-brown; abdomen bright reddish-ochraceous; wings cretaceous-white, opaque, the venation dull ochraceous; body above and beneath more or less palely pilose; posterior femora with two long strong spines beneath and a shorter and more obtuse spine just in front of the anterior spine; structural characters as in generic diagnosis.

♀. Long., excl. tegm., 27 millim. Exp. tegm., 75 millim.

Hab. China; Prov. Shen-se, Sin-ling (Wilfred A. Maw—Brit. Mus.).

NEW AMERICAN BEES.—VIII.

By T. D. A. COCKERELL.

Nomada vexator, n. sp.

♀. Length, 7 to 8 mm.; ferruginous red; head, thorax, and legs marked (not heavily) with black, but with no yellow; abdomen shining light ferruginous, with no black except three spots (one basal and two lateral) on first segment, and even these sometimes hardly developed; second abdominal segment with a variable but always large cream-coloured patch on each side; third segment with much smaller spots, sometimes reduced to dots; fourth with two transverse subdorsal spots, sometimes absent; fifth with a pair of large spots, usually confluent; apex with a rather narrow band of silvery tomentum. Antennæ entirely clear ferruginous, third joint a little longer than fourth, flagellum rather thick; mandibles simple; first joint of labial palpi much longer than the other three united; middle of face, connecting with a large area enclosing ocelli, and hind part of cheeks, black; scutellum strongly bilobed; mesothorax very densely punctured, with a median black band, broadening anteriorly; metathorax with a black band, and its sides with white hair; tegulæ bright ferruginous; wings dusky hyaline, clear subapically and strongly dusky at apex; stigma ferruginous, nervures fuscous; b. n. meeting t. m.; second s. m. large, receiving the r. n. far beyond its middle; third s. m. narrowed greatly above; tibiæ and tarsi without black, but the femora marked with black, especially the hind ones; venter of abdomen red without markings. In my table of Rocky Mountain *Nomada* (Bulletin 94, Colo. Exp. Sta.) this runs nearest to *N. luteopicta*, but differs in the proportions of the antennal joints, and the pale yellow abdominal markings. The same characters, and the venation (b. n. meeting t. m.) readily separate it from *N. cymbalarica* and *N. mera*, which run to the same point in the table. In many respects *N. vexator* resembles *N. accepta*, but the abdomen is much darker and more copiously ornamented with cream-colour in *accepta*, while the mesothorax is three banded, and there are yellow spots at the lower corners of the face.

♂. Length, 7 mm.; head and thorax black, without any red; both densely punctured, and with quite abundant white hair, which is appressed and bright silvery on face; thorax with no light markings except a cream-coloured spot on the tubercles; clypeus with the lower half (narrowest in the middle), lateral marks sending linear upward extensions to level of antennæ, scape in front, labrum, and mandibles except apex, light yellow; third antennal joint about as long as fourth on upper side, but much shorter below; scape and first four joints of flagellum black above, remaining joints showing successively decreasing infuscation: legs red, anterior and middle femora black basally beneath, hind femora black with the apex red; second s. m. narrower than in female, receiving r. n. in middle; abdomen marked nearly as in female, but basal half of first segment nearly all black, and blackish transverse stains on third and fourth; apical segments with thin white pubescence; apical plate very narrow and

pointed, entire; venter red, with black only on first segment. The markings of the abdomen are not unlike those of *N. gracilis*, but the apical plate is entirely different.

Hab. Troublesome, Colorado, alt. 7345 ft., June 9th, 1908 (S. A. Rohwer). One male and five females, the type being one of the latter.

Nomada wootonella, n. sp.

♂. A small species closely related to *N. sayi*, Robertson, but differing as follows:—Head broader, eyes more diverging above; lateral face-marks not so large below; eyes pale green; pleura with a dull yellowish spot in front; legs light ferruginous, the anterior ones largely yellowish, and the others spotted with yellow, the hind femora with a brown spot behind near apex; abdomen with the yellow markings enlarged, so that the second and third segments have very broad bands, narrowed and interrupted in the middle; apical plate entire, or with only a faint trace of the emargination which is so conspicuous in *N. sayi*. The *N. sayi* compared is an authentic specimen from Robertson.

Hab. Mesilla Park, New Mexico, April 26th (T. D. A. Cockrell). At flowers of *Sophia ochroleuca*, Wooton. Named after Prof. Wooton, of the New Mexico Agricultural College, who described the plant it visits.

Nomada civilis, Cresson, 1878.

Cresson described this from nine males collected in Colorado. It is very variable, both in size and markings. At Troublesome, Colorado, alt. 7345 ft., June 9th, 1908, Mr. S. A. Rohwer took both sexes. The female runs in my table of Rocky Mountain *Nomada* (Bull. 94, Colo. Exper. Sta.) to *N. agynia*, male, but is quite distinct from that species. As is usual in the group to which the species belongs, the female *N. civilis* is very unlike the male, agreeing, however, in the very broad face, with the orbits diverging above. The following characters of the female are distinctive:—

Lower part of face, including labrum and supraclypeal mark, lemon-yellow; orbital margins above middle of face broadly ferruginous, this continuing over to the cheek, on the lower half or more of which it gives way to yellow; scape ordinary, yellow in front, antennæ otherwise wholly ferruginous, without black or dusky; mesothorax rough, black, with a little red at extreme sides; tegulæ light ferruginous, with a yellow spot in front; tubercles and upper margin of prothorax yellow; pleura ferruginous, with a suffused yellow patch; scutellum and postscutellum yellow, with reddish hair; metathorax black, with a pair of large round light red spots, varying to slightly yellowish in the middle; legs clear ferruginous red, the apices of the femora and anterior and middle tibiæ conspicuously marked with yellow; abdomen bright lemon-yellow, with clear ferruginous bands above and below; on the first segment the yellow is reduced to a mark (one-third of a band) on each side, and

there is a black subbasal median spot; on the second segment the yellow is much narrowed in the middle.

Nomada truttarum, n. sp.

♂. Length about 8 mm., the abdomen fusiform and rather slender; belongs to the subgenus *Xanthidium*. Head broad, orbits not greatly diverging above; face with appressed silvery hair, not concealing the surface; mandibles simple; mandibles except apex, labrum, clypeus (a black sutural spot on each side), quadrate supra-clypeal patch, and large lateral face-marks (filling in the whole area between clypeus and eyes, and extending from upper corners of clypeus, touching the antennal sockets, to a point some distance above antennæ) all pale yellow; a narrow yellow stripe, becoming reddish, extends up posterior orbital margins, and there is a ferruginous patch above summit of eye; third antennal joint scarcely over half length of fourth; scape moderately swollen, yellow in front, black behind, the junction of the colours reddish; flagellum stout and long, red, with the first five joints strongly blackened above, and the third to fifth strongly undulate; apical joint obtuse; thorax black, with the hair all white, especially conspicuous on pleura; scutellum, four rather obscure stripes on mesothorax, part of prothorax above, and a large spot on anterior part of pleura, all ferruginous; tubercles pale yellow suffused with red; mesothorax entirely black; tegulæ shining hyaline testaceous, with two pale yellow spots; wings dusky at apex, otherwise nearly clear; stigma dark ferruginous; b. n. going a long distance basad of t. m.; second s. m. large, broad above, receiving the r. n. at the beginning of its last third; third t. c. abruptly bent; legs red, without yellow, except that the anterior femora are suffusedly yellowish in front; a little black at base of anterior femora, more on middle femora, and hind femora broadly black beneath except at apex; abdomen rather well punctured; first segment black basally, and with the broad band red without any yellow; second segment red, with an exceedingly broad lemon-yellow band, narrowly interrupted in the middle (by a longitudinal red band) and notched at each upper lateral corner; segments three to six red with yellow bands, on three and four widely interrupted, on six a median patch, not reaching the sides of the segment; apical plate broad, strongly notched; venter red, suffused with blackish, and with a large diamond-shaped yellow spot at extreme apex. In the tables of Rocky Mountain *Nomada* runs to *N. vicinalis*, Cresson, from which it differs by the large lateral face-marks, first abdominal segment without yellow, &c.

Hab. Trout Spring, Gallinas Canyon, New Mexico, May 24th (T. D. A. Cockerell).

Osmia malina, n. sp.

♀. Length about 9 mm., thick-set, brilliant dark indigo-blue, the hind margins of the abdominal segments concolorous and very narrowly impunctate; legs black, without metallic tints; antennæ entirely black. Face broad; hair of face and vertex coarse and black, but on each side of the antennæ is a patch of white hair, recalling the

appearance of *O. albolateralis*, which is in other respects a very different species. Lower edge of clypeus black, slightly elevated, but not peculiar in any way; mandibles with two pointed teeth, and a truncate subemarginate inner one; hair of cheeks black, but a conspicuous tuft of white hair on prothorax at sides of base of head; tubercles with white hair, pleura with black, sides of metathorax with white; dorsum of thorax with mixed black and white hair, the black preponderating, except posteriorly, along hind margin of scutellum; wings very smoky; legs with short black hair, shining brownish on anterior and middle tarsi; abdomen with white hair on first segment and extreme base of second; the other segments with short black hair, with a few light hairs intermixed on second and third, and much glittering white hair on fifth; scopa and hair at sides of abdomen black. Superficially like *O. wilmatta*, Ckll., but distinguished by the second s. m. more produced beyond the second r. n., the thorax above with much more black hair, the larger ocelli and the tufts of white hair on the face. From *O. giliarum*, Ckll., it is known by the abundant black hair on the thorax above, and the white hair on face. From *O. pikei*, Ckll., it differs by the broader, deep blue face, &c.

Hab. Northern Colorado, in the region near the foothills, either in the vicinity of Boulder or Loveland (Clarence De Voss).

Osmia (Acanthosmioides) nifoata, n. sp.

♂. Length, 9 mm.; dark greenish blue, the abdomen shining; hair of head and thorax entirely white; flagellum black or almost above, ferruginous beneath; apical tooth of mandibles very long, the other subobsolete, broadly obliquely truncate; tegulæ blue in front; wings clear, a little stained along the veins; legs black with strong metallic tints, especially on the femora behind; hair of legs partly light and partly dark, the anterior and especially the middle tibiæ conspicuously fringed with white hair behind; hind femora strongly swollen, their hair largely black; hind tibiæ conspicuously bent; inner side of hind basitarsus with dark fuscous hair; first abdominal segment with white hair, second with white and black, the others with black, a little white near hind margin of third; sixth segment entire; seventh bidentate; second ventral longitudinally grooved, and with a short compressed apical tooth, scarcely a third the length of the segment. As in *O. odontogaster*, the ventral tooth is sometimes slightly bifid at the end. Distinguished from *O. odontogaster*, Ckll., by the entirely different colour, and broader abdomen. It is nearer to *Osmia ashmeadii* (*Acanthosmioides ashmeadii*, Titus), but differs from that by the much darker flagellum and the absence of a carina on the first ventral segment. The eyes are sage-green.

Hab. Troublesome, Colorado, 7345 ft., June 8th and 9th, 1908; three males (S. A. Rohwer). This is the first *Acanthosmioides* from the Rocky Mountains.

NOTES ON BRACONIDÆ.—IX.: ON THE REMAINDER OF MARSHALL'S COLLECTION.

BY CLAUDE MORLEY, F.E.S., &c.

I FOUND but little to note on going through the remainder of this valuable collection at the beginning of March. Such facts as are noteworthy relate to the synonymy and rectification of the British list.

Meteorus brevipes, Wesm.: In the second volume of his 'Bracon. d'Europe' (André, 1891), Marshall inserts this as an insufficiently described species at the end of its genus, with the remark, "Belgique (Bruxelles); un seul exemplaire connu." Subsequently he evidently succeeded in recognizing it, for in his collection are eight males from Botusfleming, St. Albans, and Cornworthy. It is somewhat similar superficially to *M. filator*, Hal., though of stouter conformation.—*Calyptus ruficoxis*, Wesm.: One female is from "Darenth Wood"; it was only previously recorded from Belgium and Holland.—*Alloa contracta*, Nees, male, is synonymous with *Lamadatha testaceipes*, Cam.!—*Blacus humilis*, Nees, is a very doubtful species, and is, at least temporarily, sunk to *B. trivialis*, Hal.—*Blacus aptenodytes*, Marsh., is a synonym of *Blacus mamillanus*, Ruthe.—*Aphæreta major*: Marshall erects a form he had previously (André, 'Bracon. d'Europ.' ii. 401) considered a variety of *A. cephalotes*, Hal., to the dignity of specific rank under this name, and records it from "Angleterre." The type is not in his collection.—Haliday's two species of *Prosapha*, Först., are now synonymised under the earlier name, *speculum*, Hal.—*Aspilota distracta*, Nees, is a variety of the same author's earlier described "*Bassus*" *concolor*.—The British Museum collection of British Aphidiinæ (Flexiliventre) is peculiarly full; it contains many of Haliday's original specimens, a large collection, together with the Aphididous hosts from Bignell, and all those in Marshall's possession; others from Stephens's and Desvignes's collections have not yet been amalgamated, through lack of time to synonymise the old (and often MS.) names under which they at present stand.

Ditherus ruficollis, Cameron, the male type of which was acquired by the Museum authorities in 1902, is nothing but a synonym of *Cardiochiles saltator*, Nees. It is here represented by both sexes, *ex coll.* Sir S. S. Saunders, from Albania; *ex coll.* Ruthe, from Germany; and *ex coll.* Marshall, from "Caucase."

The National Collection of British Braconidæ is now rearranged.

Monk Soham House, Framlingham, Suffolk.

NOTE ON THE SUPPOSED LARVA OF *PIMPLA OCULATORIA*, F., FIGURED IN MORLEY'S 'BRITISH ICHNEUMONS,' VOL. III., 1908, AND ITS LOCATION AMONG THE DIPTERA.

BY J. E. COLLIN, F.E.S.

MR. CLAUDE MORLEY has described and figured on p. 114 of his latest volume on British Ichneumons what he supposed might be the larva of *Pimpla oculatoria*, F., found in an egg-bag of *Epeira diademata*, taken from under the coping of a garden wall in Ipswich; this larva cast its skin soon after he found it, but ultimately died.

To Mr. Morley this was an "ichneumonidous larva of most unusual form and colour;" still, the known fact of the association of *P. oculatoria* with spiders, and of its having been bred from the egg-bag of this particular spider, naturally led him to believe that the connection between the larva he found and the ichneumon, though "unsatisfactory," was "extremely probably correct."

My attention was attracted to his figure by its great similarity to the larvæ of some Diptera, while the fact that Mr. Morley had found in another egg-bag of the same spider given to him by the Rev. O. Pickard-Cambridge one similar larva-skin with "the very distinctive rostrum of the . . . described larva," and in the same egg-bag were four cocoons of the *Pimpla*, favoured the conclusion that this must be a Dipterous larva with the *Pimpla* parasitic upon it.

Mr. Morley generously allowed Dr. Sharp to examine the larval skin, and he writes: "It is no doubt that of a Dipteron of the family Stratiomyidæ. From its appearance it may have been parasitised; it has, at any rate, not been naturally cast off."

It would therefore appear that there must be a species of Stratiomyidæ, living in the larval state upon the eggs of *Epeira diademata*, though the present knowledge of the larval habits of the family in no way supports the possibility of such an occurrence. The only genus of Diptera in the neighbourhood of the Stratiomyidæ, said to have been bred from the cocoons of spiders, is *Acrocera* (Cyrtidæ), but the presence of *Acrocera* in the middle of Ipswich would be somewhat remarkable.

It remains for someone to clear up this interesting question by rearing one of these larvæ, which unfortunately Mr. Morley failed to do.

[That the attack upon the spiders' egg should be in the form of hyperparasitism has never before been suggested, and certainly did not occur to me when writing my article upon the subject (Ichn. Brit. iii. 113-115), which is certainly worthy of very close attention (cf. Grav. Ichn. Europ. iii. 154; Westw. Mod. Class. ii. 143; Laboulbène, Ann. Soc. France, 1858, p. 800,

et *lib. cit.* 1871, p. 444; Brischke, *Schr. Nat. ges. Danz.* 1880, p. 113; Rogers at Meeting Ent. Soc., 2nd April, 1866, et Johnson, *E.M.M.*, 1907, p. 160).—CLAUDE MORLEY.]

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

BY GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 32.)

THERE is one more named form belonging to the *navarina* group, which was originally supposed by de Sélys-Longchamps to be *asteria*, and so named by him, doubtfully, in his 'Énumération des Insectes Lépidoptères de la Belgique,' in 1845. In 1857, however, it was given as an aberration of *athalia* ('Annales de la Société Entomologique Belge, vol. i. p. 19) under the name of *asteriades*, de Sélys-Longchamps, and is briefly described as "très petit et très noir."

With regard to the greater variety of colouring on the upper side, in which some specimens, especially females, approach nearer to the *Aurinia*-group, there seems to be only one named form in which this peculiarity is prominent, and even in this case the insect seems to be named rather after a peculiarity of the un. s. h. w. than from anything in the appearance of the up. s., viz.: *leucippe*, Schneider, 'Systematische Beschreibung,' p. 209 (1787). This form was described as a distinct species, in the following terms: "Alis dentatis, supra fuscis, primoribus ad marginem luteis striis duabus venisque nigris; posterioribus serie triplici macularum pallidiorum et subtus fasciis fulvis flavis et albis." Reference is made to Esper's 'Schmetterlinge Europas,' pl. xxx., fig. 2, which, in spite of what Schneider says to the contrary, shows it to be a female aberration of *athalia*, with suffusion extending over the basal half of each wing, and having the lunules on the up. s. h. w. lighter, and the ground colour between the outer and inner lines redder than usual; the very narrow streak of ground colour showing within the inner line is of normal colour. The un. s. f. w. has in places a redder shade than usual, and the elbowed line is clearly marked by large black spots throughout. The h. w. has the terminal lunules, the outer half of the central band, the light spot, and part of the basal band white; hence, it would seem, the name. Schneider regards this form as being included in Linnaeus' *maturna*, showing that the variation of colour on the upper side was in his eyes very noticeable. Seba's illustration ('Thesaurus,' pl. iii. A., figs. 1-4), to which he refers, appears to me, so far as it is possible to judge, to represent *athalia*. To Petiver's 'Icones Papilionum Britanniae,' I have unfortunately been unable to refer, as there is no copy of this work in the British Museum, nor in any of the other great London libraries.

An aberrational form of this species was described and figured in the 'Bulletin de la Société Lépidoptérologique de Genève,' vol. i. pt. iii. p. 262, pl. 8, fig. 5 (1908), under the name of ab. *alba*, Rehfsous. It is described as follows: "la couleur du fond, normalement fauve, est remplacée par du blanc pur. Sur le dessus des ailes il ne reste pas la moindre parcelle de la couleur normale; les dessins foncés n'entourent que du blanc. Dessous, de légères traces de fauve se retrouvent sur les nervures et de chaque côté des lignes noires."* This appears to be a singularly perfect form of albino, for the colouring matter is absent not only from the ordinary fulvous scales but from the feathery portion at the base of the wings, from the fringes, and to a great extent from the palpi and legs. This example was taken at Iselle on the south side of the Simplon on July 14th, 1907, and in the same paper another similar specimen is mentioned as having been taken near Geneva on July 13th, 1904. With regard to the species to which these aberrations are referred, the dates would seem to leave no doubt as to the correctness of the diagnosis, even if the illustration of M. Rehfsous's specimen were not in itself conclusive. In a footnote it is added that the name is intended to serve as a concise description, and to apply not only to the species to which these particular examples belong but to similar aberrations of other species; *M. dictynna*, *M. didyma*, *Argynnis (Brenthis) selene*, and *A. (Issoria) lathonia* are specially mentioned. It will indeed be an advantage if this extended definition be accepted and adhered to more completely than has been done in the similar but far more extended case of the Lycænid aberrational forms dealt with by Courvoisier in the 'Bulletin de la Société Entomologique Suisse,' vol. xi., pt. i., pp. 18-25, pl. ii. (1903), where general names applicable to all the usual forms of aberration common to several species were suggested. Some of these were no doubt barred in certain cases by the "law of priority," but in all others these names ought certainly to have been accepted, even if this be not a case (as I most strongly hold it to be) where this apparently iron law of priority should have been made to bend. Surely it is not now outside the range of practical politics to press for the formation of an international council by which all such questions should be definitely decided? There are, of course, certain obvious difficulties in the way, and in making the attempt, others, unforeseen, would probably come to light, but none appear to be of such a character as to be necessarily insurmountable, and the result in clearness of meaning, in saving of time and labour, and in turning valuable

* The ground colour, normally fulvous, is replaced by pure white; on the upper side of the wings there does not remain the slightest particle of the normal colour, the dark design surrounds nothing but white. Beneath, slight traces of the fulvous again appear on the nervures, and at each side of the black lines.

(and in some cases invaluable) energies into a more profitable channel would be incalculable.

(To be continued.)

NOTES AND OBSERVATIONS.

THE COCCID GENUS *CEROPUTO*.—Having occasion to examine some material of *Ceroputo calcitectus* (Ckll.), collected by Mr. E. Bethel on *Agropyron* at Canon City, Colorado (the species new to Colorado), I chanced to notice the resemblance of the male, especially in the venation, to *Monophlebus trivenosus*, Germ. & Ber., from Baltic amber. Upon comparing the figure of *M. trivenosus* with a male *C. calcitectus* it became evident that they were congeneric, so the amber fossil must be known as *Ceroputo trivenosus*. The only noteworthy difference between the two is that the caudal style is considerably shorter and broader in the fossil.—T. D. A. COCKERELL.

A LITTLE WORK ON SPIDERS.—Though the study of spiders is not considered strictly a part of entomology—at least, in Britain—yet most “general entomologists” take some interest in them. Possibly the lack of a cheap, convenient, modern manual has deterred many from paying attention to these interesting forms. Recently I have had occasion to work up the spiders of the Hawaiian sugar-cane fields. Many of these are immigrants, and although, of course, Simon’s great volumes are indispensable to any serious spider work, yet I have found a more modest little book very useful in giving me a preliminary idea (in the absence of a reference collection) of these immigrants at the outset of my studies, as Simon’s ‘*Histoire Naturelle des Araignées*’ does not deal fully with species. Planet’s ‘*Araignées*,’ published in 1905 as the fourteenth part of Deyrolle’s ‘*Histoire Naturelle de la France*,’ has not, I believe, been noted as yet in the ‘Entomologist,’ but will, I am sure, be very useful to any British entomologist who is at all interested in spiders. It is portable, cheap, runs to 341 pages, 18 well-executed plates, and 230 text figures, making a total of 370 figs. As the proof-sheets were read by Mr. Simon, the accuracy of the volume is guaranteed.—G. W. KIRKALDY.

ACROLITA CONSEQUANA, H.-S., IN DEVONSHIRE.—I have to record the discovery of the larvæ of this local Tortrix by my wife in South Devon in July, 1907. They were feeding on the seed-heads of the spurge (*Euphorbia paralias*) on the sandy flats near the sea. The imagines, seven in number, duly emerged on August 6th following. They are smaller than usual, owing no doubt to the drying of the food-plant on our return home. I am indebted to the kindness of Mr. E. A. Atmore, F.E.S., of King’s Lynn, for confirming the identity of the species. As far as I can discover it does not appear to have been recorded for this county before. Mr. Stainton describes it under the name of *Pæcilochroma hawkerana*, and gives as its locality “on the Hampshire coast” (‘*Manual*,’ vol. ii. p. 239). Mr. Meyrick records it from Hants and Dorset (‘*Handbook*,’ p. 505). Mr. Barrett, on p. 73, vol. xi. says: “It is only known to be found in Hayling Island,

Bournemouth, the Isle of Portland, and the Chesil Beach, in the counties of Hants and Dorset"; whilst I find no mention of it in the 'Victoria County History of Devonshire.'—C. GRANVILLE CLUTTERBUCK, F.E.S.; Heathside, Heathville Road, Gloucester, March 15th, 1909.

RECENT SALES OF LEPIDOPTERA AT "STEVENS'S."—The first portion of the valuable collection formed by the late T. Maddison, Esq., of Durham, was offered in six hundred lots on February 23rd and 24th last. It embraced a large number of aberrations, and for many of these there was keen competition among bidders. Thirteen varieties alone realized a total of £103, made up as under:—

Gonepteryx rhamni, a specimen with the disc of the wings of a dull orange colour. £6 10s.

A superb rayed variety of *Argynnis paphia*, female; fore wings, except base, very dark and suffused, the under side of hind wings with base and margins silvery, central fascia green (New Forest, July, 1899). £8.

A female of *A. aglaia*; hind wings with broad dark bands, from which rays extend to margin (from the Linnean coll.). £9 10s.

A. euphrosyne.—A unicolorous tawny orange var.; dark markings obsolete, except at base of wings (Abbot's Wood, 1897). £9.

Melitæa athalia.—A very unusual aberration; obscure, with central band of pale spots on under side of hind wings; (Abbot's Wood). £9.

A black variety of *Vanessa antiopa*, with outer costal blotch obsolete (Sherburn, August, 1892). £7.

A remarkable aberration of *Vanessa polychloros*; margin irrorated, costal blotches united (New Forest, June, 1902). £7 10s.

A very fine dark variety of *Apatura iris*; white markings almost absent (from the Stevens coll.). £7.

The fine aberration of *Epinephele tithonus* figured in the 'Entomologist' for October, 1897. £8 10s.

A golden brown male specimen of *E. ianira* (Polegate, June; Entom. xviii. 320). £6.

A specimen of *Arctia caia*, with the fore wings brown shading to lighter, and the hind wings entirely deep yellow (bred, Liverpool, 1905), secured the highest bid of the sale, £13.

An exceptionally dark aberration of *A. caia*, with the hind wings almost entirely shiny black (from Mason's coll.). £6.

A black male *Dicranura vinula* (Scarborough, 1898), with two other aberrations of the same species. £6.

(To be concluded.)

CAPTURES AND FIELD REPORTS.

LARVÆ OF LEPIDOPTERA IN NOVEMBER.—Is it a recognized entomological device for collecting larvæ in autumn to beat the heaps of bracken cut for fodder over a tray? By doing so in November last year I took an extraordinary number of larvæ, including about four hundred *Phragmatobia fuliginosa*, and some *Parasemia plantaginis*,

Argynnis selene, *Cosmotriche potatoaria*, *Aplecta tincta*, *A. nebulosa*, *Noctua brunnea*, *N. triangulum*, and *Triphana pronuba*, with several Geometrids. I took these in two or three days in woods near Oxford. C. MELLOWS; Oxford.

RECENT LITERATURE.

The Genitalia of the Group Noctuidæ of the Lepidoptera of the British Islands. By F. N. PIERCE, F.E.S. Pp. xii., 88, pls. xxxii. Liverpool: A. W. Duncan, 65, South John Street. 1909. 7s. 6d.

THIS book marks an era in the study of the British Lepidoptera. Mr. Pierce tells us it is the outcome of twenty years' study, and many students of British Lepidoptera during that period have known him as expert in making preparations of the organs here treated of and as learned in the study of the specimens so treated. The magazines during that period report many instances in which questions of specific identity or differentiation have been referred to him for investigation, not only in the Noctuæ but more or less throughout the Lepidoptera, and always with a result advancing our knowledge.

The volume is the first attempt that has been made to describe these appendages throughout a whole family of the fauna of a district. There are figures of the genitalia of some three hundred and fifteen species, the Noctuæ of the British Islands. Of course, this is after all but a flea-bite to what an examination of all the Noctuæ would be, the Catalogue of these by Sir George Hampson presenting a vista of almost interminable volumes.

The earliest observations on the genitalia of the Noctuæ that we recollect are those of Lederer ('Noctuinen Europa,' 1857); he figures the end of the clasp in thirty species. It is interesting to note that his figures are crude to the last degree, yet illustrate that these parts vary in the different species. Down almost to the present time we find much vagueness in figures of these organs, as in a recent illustration in a German periodical figures appeared of the genitalia of *Everes argiades* to prove its identity with *alcetas*, yet the figures would have served equally well for *Cupido minimus* or even *sebrus*. Even Scudder's figures are often rather vague, and quite inadequate to convey any very definite idea of the structures, and would often fail to distinguish allied species, although they are very nicely drawn.

One of the earliest really satisfactory plates of male appendages of Noctuæ is plate xi. in the first vol. of 'Iris' (1884) of four species of the *lucernea* group of Agrotids.

Dr. K. Jordan's figures in the Novit. Zool. are certainly far and away the most excellent in all respects. His account of the appendage of the Sphinges is certainly the most complete and accurate piece of work of this class that exists, and though only part of a general monograph of the Sphinges, is itself a most important monograph, and one wishes it were less enfolded with the other material. It includes of course our British Sphinges, but these are so few species that it hardly strikes us that it is dealing with a British family.

Those who still retain any doubts as to the value of these organs

for descriptive purposes must surely lay them aside when they look at the figures in this volume, where, in the three hundred odd figures, it would be impossible to find one that could be confused with any other. Mr. Pierce says he sees no difference between *favicolor* and *pallens* except size, yet if his figures can be relied on there is considerable difference in some of the proportions and in the spinous armature of the *cucullus*. It is a case like this in which a photograph, even a poor and imperfect one, would much exceed in value any drawing. There are, however, two circumstances which make the appendages rather more valuable than any other structure, or even than a combination of other characters, for the decision of a question either of specific distinction or of generic or familiar alliance. One of these is that so long as two forms remain one species, that is, are syngamic, or breed together, directly or indirectly, these parts are kept identical in both. As soon as they become distinct species, divergence of the parts is liable to occur, perhaps rapidly. Only syngamy can keep these structures uniform throughout a group of forms. When syngamy ceases, they are free to vary, the only necessity being that they remain identical throughout each syngamic group. But their variation is not restrained by any such question as adherence to a food-plant, avoiding particular enemies, &c., as nearly all other characters used to define species are characters that are kept constant by natural selection. The other circumstance is that they are highly organised and for the most part hard, chitinised structures, so that they afford many details for observation and these details are embodied in forms less difficult to seize than many such items as colour, wing markings, &c.

It is now well known, Dr. Jordan having perhaps most clearly pointed the fact out, that geographical races have these appendages varying a little in each race. In some cases, when the segregation is great, these no doubt mark incipient species; when the segregation is incomplete, as at the extremities of an extended habitat, there may be a difference that is prevented from becoming great by mediate syngamy.

When there is immediate syngamy throughout a group of forms (unquestionable species) we may expect to find great uniformity throughout the group, but it is highly probable that in such a group variations may take place very rapidly, the whole group moving together. This seems a conclusion inevitable from the many instances we meet with in which the appendages are extremely different in closely allied species.

Unquestionably the appendages, like everything else, are under the control of natural selection, but as to what the circumstances are that tend to govern the selection, we are certainly at present very much in the dark, so that if our argument seems to suggest that they have escaped its control, all that is postulated is that they are not controlled by any of those items of environment that have to be counted on by most other characters, and that as a result two newly established species may retain by force of similar environment a very similar facis and structure in everything but these structures, which are free to vary to any extent if only they vary together throughout each specific group.

Some of the most difficult problems met with in the study of these genitalia are involved in the striking discovery that our *H. nictitans* consists not of two species or possibly three, as Mr. Tutt established a considerable time ago, though not perhaps incontestably, but actually of four very distinct species, barely capable of being distinguished from each other without reference to the appendages (there is no great difficulty in separating typical English *paludis* and *nictitans*). An examination of the appendages suggest, nevertheless, that *crinanensis*, the new species discovered in his researches by Mr. Pierce, belongs not only to a distinct species but that it should be placed in a separate genus. The query then presents itself, Is this a derivative from the *nictitans-paludis-lucens* forms, or is it by mimicry or some other reason approaching them from elsewhere? We have never quite satisfied ourselves, perhaps from want of proper enquiry, that Pierce's species *lucens* is identical with *nictitans* var. *lucens*. At any rate, *lucens*, Pierce, is to be found amongst series of simple *nictitans* in collections, and *nictitans* var. *lucens* is very commonly really *nictitans*. We have a strong suspicion that *nictitans*, Pierce, and *lucens*, Pierce, both have forms that are erroneously regarded as respectively *nictitans* and *lucens*. We find no discussion of these questions in "The Genitalia."

We miss also any discussion of the question as to *Noctua thulei*, Stgr. (*conflua*, Tr.?). Mr. Pierce mentions *conflua* as identical with *festiva*, but says nothing as to what he means by *conflua*, whether the mainland var. of *festiva*, or the distinct or semi-distinct Shetland form.

It must be recognised that all such questions can only be authoritatively solved by exploring also the allied species; only so can the amount of difference necessary to prove specific identity or otherwise be gauged, as, for instance, *Everes argiades* and *alcetas* and *Cupido minima* have appendages that, at first glance, are absolutely identical, but minute, constant differences can be detected that make them clearly three species. On the other hand, *Plebius ægon* has variations between individuals, even between the opposite clasps of one individual, that exceed in amount the difference that in the Everids just referred to distinguishes species.

Mr. Pierce's work will no doubt give an impulse to the study of the genitalia of the Lepidoptera, calculated as it is to give much assistance in their study. Though very complete, it nevertheless suggests various directions for further study; the marvellous structure of the "Vesica" (Pierce), an investigation of the curiously aberrant forms in *silago* and *oxyacanthæ*, are only a little more obvious than many other points for investigation.—T. A. C.

Critical Notes on the Classification of the Corduliinæ (Odonata). By J. G. NEEDHAM. Columbus, Ohio, December, 1908. (Annals of the Entom. Soc. of America, i. No. 4).

WE have here a system of classification of the genera of the Corduliines of the world based on wing-venation. Two diagrams explain the terms employed. Students of the Odonata will find this short article of much interest, Mr. Needham having been so long at work on these insects.—W. J. L.

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THE FOOD-PLANT OF *L. ORBITULUS*.

BY T. A. CHAPMAN, M.D., F.Z.S., &c.

LAST summer (1908) I met with *L. orbitulus* abundantly in several of the valleys south of the Rhone, but especially in the Binn Thal, in the first week in August. I had the pleasure of observing it ovipositing in various localities on the slopes of the Holzerspits. The plant on which the butterflies were laying was *Androsace (Gregoria) vitaliana*.

Having ascertained this, I noticed that this plant was common wherever the butterflies were most abundant. The plants where the butterflies flew were beyond the flowering season, possibly two or three weeks, but 1000 ft. or so higher up, where there were no *orbitulus*—in fact, at about the highest limit of the plant—it was still in flower, each plant presenting a beautiful patch of crowded yellow flowers. The butterflies laid on and under the leaves near the summit of each branch or rosette of leaves.

The larvæ hatched in seven or eight days, and fed freely on the leaves of the plant. I succeeded in getting several larvæ full-grown in the first skin, but failed to get further. The plants I brought home with me soon died, and some I succeeded in getting from a nursery were covered with aphides and very unhealthy, and soon died, although I managed to clear off the aphides, and so the experiment came to an end. I was thus unable to tell at what stage the larva hybernates; it can hardly be later than the second instar, though on the sun-baked slopes where much of the plant grew no doubt rapid progress might be made.

However, I have determined the food-plant, which is important, and have obtained photographs of the egg (by Mr. Tonge), and obtained a preparation of the larva in the first instar showing its structure, well photographed by Mr. F. N. Clark.

I add a note on the colouring, &c., of the larva when full-grown in the first instar. My note was made on September 5th,

1908 :—There are now visible two young larvæ very nearly full-grown in their first instar. There may be others present, but unfortunately various rosettes of the plant have died or are dying, and it is feared the larvæ on these have strayed away or have died. The plants have been nearly cleared of aphides, but it is not certain that these were the cause of their unhealthy state. The larvæ still thrust their heads into the fleshy interior of the leaves, mining out the tissue and leaving the upper and lower cuticles as colourless pellicles. The larvæ are nearly 2 mm. in length, and are pale reddish, with the dorsal crest-hairs black; they are very evident when on a green leaf, but match very closely the reddish dead leaves below the growing rosette. Their ground colour is compounded of a pale, almost yellowish, ground colour and dark reddish-brown markings. The dorsal line is broadly red (brown), the lateral line pale. Above the lateral line is a dark band, then a pale one slightly echeloned, as bounding below, the next dark line, consisting of the oblique lateral lines sloping downwards and backwards. Between these and the dorsal band is a pale area, widest at the posterior margin of each segment, and having a dark central spot. Beneath the lateral line is a darker shade (paler than the dark of upper surface), and then the pale ventral area.

NOTE ON THE PUPATING LARVA OF *ATTACUS* *EDWARDSII*.

By J. HENRY WATSON.

IN a batch of cocoons sent me from Calcutta, and despatched thence on February 5th, was one cocoon that had a dull sound on shaking it, as if the moth had become ready to emerge. I opened the cocoon to see, and was very surprised to find that the larva had never shed its skin, and had not advanced in its pupation (after completing its cocoon) more than about five days—that is to say, it had become dormant, and in this state had travelled to England. At the time of writing it has been at least a month in cocoon. The head, which is opaque and yellow, is still retractable within the first thoracic segment, and has the jaws, spinnerette, and palpi quite and freely movable; but the antennæ are withdrawn apparently from the larval antenna cases. The true legs are movable about as much as an ordinary larva is during moulting, and they have not been as yet withdrawn from the larval shell. Whilst holding it on the palm of my hand it made very free movements of the head and thoracic segments, stretching them out, and making by the rhythmic contraction of its body a vain attempt to walk; the

five pairs of abdominal legs are now quite functionless, and the whole of the hinder end of the body not nearly so active as the anterior end. I trust I shall be able to get it to pupate and emerge as a moth.

The following is a description of the larva of this beautiful and rather rare moth, as far as can be judged by this specimen. It bears a great resemblance to *Atlas*, and I think in its earlier stage will be covered with white farina, as there are some slight indications of this in the body creases at the hinder segments. The whole body is a dull apple green, with faint darker patches or spots, exactly as found in *Cynthia* and *Atlas*. There is now no white farina, this being probably rubbed off.

The head is dull yellow as in *Cynthia*. The sides have a few small scattered pale blue flat tubercles with black centres, and there are two rows of dorsal tubercles of a beautiful shining turquoise blue, half an inch or more in length, thicker at the base and tapering to a fine point. These tubercles bear a few scattered wart-like black dots, which each emit a fine bristle. The four thoracic tubercles are twice as thick as the others, more truncated and heavily covered with black shining warts, and are like the others of turquoise blue. The two tubercles on the third thoracic segment are more widely separated than the rest, so that they stand out of the line, a little down the sides of the larva. The anal segment is of a drake green, with a carneous spot-edged turquoise on the anal pair of legs.

It greedily drank a small drop of water, which I have often seen Saturnidæ larvæ do.

I have since had a further consignment; but the box had been opened by Postal Authorities, cocoons tipped out and tumbled back again anyhow, not packed as they were before, the lid pressed down tight, and so crushing the cocoons that there are only four out of twenty unhurt (one was entirely missing). One which was just alive was in the dormant condition of the preceding larva, but had been crushed half flat—it has now died.

Really, this wanton destruction by Postal and Customs Authorities abroad should be redressed. Some years ago I sent to North America *via* New York a corked box with a glass lid containing set specimens of rare hybrid Saturnidæ, tied with string and a label, asking the examiners to be careful with them. They cut the cord, opened the box, and *placed the cord and label in the box amongst the moths*, closed the lid and tied up the box with string of their own. My esteemed friend, Miss Morton, said it nearly broke her heart to see them utterly ruined.

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Manchester.

COLLECTING IN HUNGARY.

BY ALBERT F. ROSA, M.D.

WHILST in Hungary during the early half of June last summer, I had the good fortune to secure a considerable number of species of butterflies quite new to the writer, including several rare and eastern species occurring in the districts visited—the neighbourhood of Budapest and at Herculesbad in the Mehadia.

At Budapest I became acquainted with Herr Abafi Aigner Lajos, who gave me a very cordial reception. I was delighted to have an opportunity of collecting with him; and he was good enough to introduce me to the Entomological Society of Budapest on one of their evenings. Herr Aigner recommended an early departure for Herculesbad, but being desirous to obtain some of the local species before going south, I remained at Budapest until the 8th, spending most of the time on that strip of what has been apparently at one time fenny ground extending from Budafok towards Kelenföld.

In these parts, the season of 1908 was more forward than usual, the weather during my stay fine, though often hazy, and butterflies here were very plentiful, and were represented, besides the special ones about to be noticed, by many common species, including *Aporia crataegi*, which was in extraordinary numbers. Nor were the good things long in showing; some large well-marked *Nomiades cyllarus* were taken at the Budafok end, and soon the splendid copper *Chrysophanus dispar* var. *rutilus* put in an appearance, and though never common, I secured a nice series of males and three females. These are of fair dimensions, measuring, males 34–45 mm., and females 41–47 mm. During my stay I only encountered three specimens of *C. thersamon*, not more than one occurring on any single day. *Apatura ilia* var. *elytie* was common flying about the willows, and occasionally alighting on the roadway, but was very wary, only a very few being netted. A couple of *Melitæa trivia* were picked up, the species being very scarce, though I must admit I expected to obtain it later elsewhere; and *Cænonympha iphis* was on the wane, but amongst those taken a few are in good condition.

At Budapest I also got a few full-fed larvæ of *Thais polyxena*, which soon pupated, and I expect will emerge at an early date. *Pyrgus orbifer* was worn, but Herr Szlabey, one of the members of the Society, handed me a fine example he had just taken.

I moved on to Herculesbad on the 9th, and arrived in a deluge of rain, but fortunately this was the only wet day I experienced. South of Temesvár Jozsephvaros the natives of the different neighbouring States are much in evidence. The peasantry of this immediate vicinity I believe speak a Latin dialect.

Advanced as things evidently were around Budapest, it was not so apparent here; some species which it was expected would be getting worn were in fine condition. The usual hosts of more common, everywhere abundant, late June species were noticeably absent, not even one *Epinephele jurtina* or *Melanargia galatea*, probably still to come; and in the Cserna-thal at least nearly everything was more or less a novelty. The first seen was *Melitæa athalia*, often clustered in groups, common enough in itself no doubt, but amongst these some were of the fine large form *mehadiensis*. *Neptis lucilla*, in fine condition, hovering over the herbage on the banks, or at more shrubby ground soaring overhead. *N. aceris* also, not too common and sometimes worn, in similar spots or often lingering over loose stones, where a beam of sunshine finds its way down to the road. Of this scarcer species I obtained a series of eight or ten good specimens. *Thecla w-album* was flying in some numbers, just making its *débüt*; and a fine brood of *Polyommatus orion* exhibiting a good range of variation, chiefly var. *ornata*, Stgr., to ab. *nigra*, Gerh., showed up at certain parts. Here also, before the road crosses the river, *Apatura iris* was generally to be noted. Two or three of *Pieris rapæ* in the, to me, unusual form *rossii*, Stefanelli (*vide* Entom. vol. xxxvii. p. 53), and *P. napi* in the var. *nappææ* was not infrequent.

On the other side further down, *Chrysophanus alciphron* was taken flying at wild thyme on the hillside; the specimens, all males, being very large and beautiful, expanding about 42 mm. One or two of *Argynnis adippe* var. *cleodoxa* and plenty of *Brenthis daphne* in the freshest order.

Accompanied by a Hungarian gentleman from Karánsebes, I made a start one morning with the intention of ascending one of the neighbouring mountains, but we found collecting so good in the forest on the higher level, further advance for the nonce was deemed inadvisable. The slopes of the mountains here are very densely wooded, and for a considerable distance upwards damage worked by the larvæ of the gipsy moth was most extensive, nothing but the bare branches, from which the larvæ dangled, at the part affected mostly oak. Further up, after passing the Weisses Kreuz, the forest vegetation changes, and the ravages of the larvæ become less apparent. At this part several *Pararge hiera* were secured, as large as *P. mæra*, for which at first they were mistaken, as also one taken as a sample at Budafok, and probably others seen and passed over in the Cserna Valley, as the latter species were the same. The path descends a little before entering a ravine, leading on to the base of the Domogled peak. In this rocky ravine, especially in the forenoon, *Limenitis populi* and its var. *tremulæ* were nearly always in evidence, and often easily secured. *L. camilla* and *L. sibylla* were very common, and these I think the writer never

saw in better condition. Here also a few *Erebia ligea* and an occasional *Eugonia polychloros*. Besides these, *Neptis lucilla* was very common and in perfect condition, especially in the neighbourhood of the spring or "*quelle*" at the upper end of the ravine, and so also was *Melitæa maturna*, some of the latter being very brightly variegated, sometimes sitting together, a dozen or more, with closed wings, from amongst which number a few could be selected easily and bottled. A little beyond here a large male of *Chrysophanus virgaureæ* was netted, the only one seen. In the afternoon on the way down, below the Kreuz, though not expected for a fortnight later, *Pararge roxelana* was frequently disturbed, and fairly easily taken when resting on the bark of trees.

The following morning I ascended the Suskului, the top of which is reached about two hours from the spring. The path at first rather monotonous, penetrates upwards through the forest, where *Pararge hiera* occasionally only was noted. After about an hour there is a break and an outcrop of rock, insects become more plentiful, and on a rough grassy slope near the summit *Erebia medusa* var. *psodea* was taken in fair condition, *Parnassius mnemosyne*, large and well marked, was exceedingly common, and here also I was fortunate in securing two specimens of *Cænonympha leander*, which species, though stated to occur in South-east Hungary, I have not noticed recorded from any particular locality. While here the sun was obscured by passing clouds for several minutes at a time, otherwise I am sure a great deal more could have been done at this particular spot. One example of what I believe was *Eugonia xanthomelas* was followed but not secured, and *Dryas pandora* occurred amongst other things on the way down. An ascent of the Domogled with a wide *detour* over the range to the west produced little of interest beyond some of those already mentioned.

Dr. Partos, one of the physicians at the Kursalon, informed me his man had seen *Libythea celtis* flying in the market; I accordingly went there several times during the forenoon on the day I was leaving and got a fine series of the species, which did not put in an appearance until between ten and eleven o'clock, after which it became very abundant, and was absolutely fresh out. The specimens taken vary little excepting in size, measuring from 39 to 49 mm. It is a very inconspicuous insect, and I recognized that I had got, as I thought, a passing glimpse of it also on the road in the Cserna-thal. Butterflies seemed indifferent to the traffic here in the market, and during the short intervals I was about I noticed more than twenty different species.

I had a card of introduction from Herr Aigner to a gentleman in Orsova, where he advised me to spend a day; but as I was anxious not to miss an expedition to Peszér which was being

arranged, and which Herr Szlabey said I should join, I did not go to Orsova. I was back in Budapest on the 15th; two members of the Entomological Society had been at Pészér prospecting the day before, and had only secured of *Melanargia iapygia* var. *suwarovius* two males. The party had therefore decided not to leave until the afternoon of the 17th, as they surmised the species was *not yet out*, and to stay two days. I regretted that I could not delay so long; but since then Herr Szlabey writes: "We visited the place, five entomologists, but none of us saw any *myrmidone* or *suwarovius*, and we returned after two days' hunting without the least hope of catching the latter species this year. I suppose for *suwarovius* it was already *too late*." I think it is quite evident that this species is not so common in this locality as formerly.

I append a list which I am afraid is not a full one, as it represents only those of which specimens were obtained and those that I distinctly remember having seen:—

Thais polyxena, Schiff.—A few larvæ, Budapest.

Parnassius mnemosyne, L.—Common on the Suskului, and occasionally in every locality at Herculesbad, including the market.

Aporia cratægi, L.—Every locality visited, especially abundant at Budafok.

Pieris rapæ, L., var. *rossii*, Stefanelli.—Cserna-thal.

P. napi, L., var. *napææ*, Esp.—Cserna-thal.

Euchloë cardamines, L.—In the ravine, Herculesbad.

Leptosis sinapis, L.—Budapest and Herculesbad, not common.

Colias edusa, Fab.—Cserna-thal, only one or two.

C. hyale, L.—Cserna-thal, not common.

Apatura iris, L.—Cserna-thal, occasionally.

A. ilia, L., var. *clytie*, Schiff.—Budafok, common.

Limenitis camilla, Schiff.—Very common at Herculesbad.

L. populi, L., et var. *tremulæ*, Esp.—Common in the ravine and in the clearings in the forest on the way up to the Domogled. Seen also in the valley and market-place, Herculesbad.

L. sibylla, L.—Also common around Herculesbad.

Neptis lucilla, Fab.—Cserna-thal and in the ravine, very common; also in the market, Herculesbad.

N. aceris, Lepech.—Cserna-thal.

Aglais urticæ, L.—Suskului, one or two.

Eugonia polychloros, L.—Always turned up in every locality at Herculesbad.

Polygonia c-album, L.—Every locality visited, especially common in the Cserna-thal.

Melitæa maturna, L.—Around Herculesbad, even in the market-place, very common.

M. phæbe, Knoch.—Budapest and Cserna-thal.

M. didyma, O.—Budapest and Cserna.

M. trivia, Schiff.—Budafok.

M. athalia, Rott., et ab. *mehadiensis*, Gerh.—Cserna Valley, very abundant.

- Brenthis selene*, Schiff.—Budapest; one or two only.
B. euphrosyne, L.—Suskului and Cserna, not common.
B. daphne, Schiff.—Cserna-thal, very common, and on Suskului.
Issoria lathonia, L.—Every locality visited, occasional specimens.
Argynnis aglaia, L.—Suskului and Cserna, frequent.
A. niobe, L., et var. *eris*, Meig.—Budapest, common; Suskului and Domogled, occasionally.
A. adippe, L.—Generally around Herculesbad. Var. *cleodora*, O.—Cserna Valley.
Dryas paphia, L.—Every locality, rather frequent.
D. pandora, Schiff.—Several on the Suskului.
Erebia medusa, Fab., var. *psodea*, Hb.—Suskului, common.
E. ligea, L.—Herculesbad, in the ravine and market-place.
Pararge egeria, L., var. *egerides*, Stgr.—Herculesbad, but nowhere common.
P. roxelana, Cr.—Herculesbad, common locally.
P. hiera, Fab.—Herculesbad, Cserna-thal, and Suskului; also Budafok. Appears to have been common.
Cænonympha iphis, Schiff.—Budafok, rather past, but not infrequent.
C. leander, Esp.—Suskului.
C. arcania, L.—Cserna and Suskului, common locally.
C. pamphilus, L.—Budapest.
Libythea celtis, Esp.—Cserna and market, Herculesbad, very common.
Thecla w-album, Knoch.—Cserna Valley.
T. acaciæ, Fab.—Cserna-thal, one specimen.
Chrysophanus virgaureæ, L.—Herculesbad.
C. thersamon, Esp.—Budafok, three only.
C. dispar, Hw., var. *rutilus*, Wernb.—Budafok.
C. alciphron, Rott.—Cserna-thal.
Rusticus argus, L.—Budapest and Cserna.
R. argyrognomen, Brgstr.—Budapest and Suskului.
Polyommatus orion, Pall.—Cserna-thal, mostly var. *ornata*, Stgr.
P. donzelii, B.—Suskului, only one.
P. icarus, Rott., et ab. *icarinus*, Scrib.—Cserna and Budapest.
P. bellargus, Rott.—Cserna and Budapest.
Nomiades cyllarus, Rott.—Cserna and Budafok, not common.
Thymelicus thaumas, Hufn.—Every locality.
Pyrgus orbifer, Hb.—Budapest.

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THE ATHALIA GROUP OF THE GENUS MELITÆA.

BY REV. GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 32.)

ANOTHER form of peculiar coloration was originally described as a separate species, viz.: *tessellata*, Stephens, 'Illustrations,' i., p. 31, pl. v., figs. 1, 2 (1828). His figure is copied from

Petiver's 'Icones' (mentioned above), pl. iii., figs. 11, 12.* This figure is in a wholly different style from Stephens' own plates, and is evidently faithfully copied, as he says, in the rough colouring of the original; the colouring must, however, have altered materially in the course of years, as there is a great discrepancy between its present appearance and Stephens' description.

Petiver's original description (without name) is: "*Papilio fritillaria tessellata serotina subtus straminea*," whilst Stephens' runs: "*Alis supra fulvis nigro tessellatis, posticis subtus stramineis fasciis tribus flavidis lunulisque nigris*." As it appears at present, the fuscous and fulvous of the up. s. are merely two shades of reddish brown (a form which I have met with more than once in nature); the un. s. f. w. has the lunules and a partial second row of spots within the outer subterminal yellow, and the rest of the wing normal in pattern and red-brown in colour; the un. s. h. w. has the outer and inner bands blackish grey, the terminal, central, and basal bands bright yellow; the light spot breaks into the basal band. Stephens' description of it runs, however, as follows: "Similar in size and shape to *M. athalia*, but evidently distinct: the wings are rather paler above: the anterior more fulvous beneath: the posterior are very dissimilar to those of the above insect (*athalia*), being entirely straw-coloured, with black nervures: at the base are three large square yellowish spots surrounded by black: an arcuated band in the middle composed of yellowish somewhat quadrate spots, which are nearly confluent and placed in a double row, and edged with black: there is then a streak of black lunules pointing outwards: then a marginal band composed of yellowish spots encircled with black, each yellow spot being (? bearing) a black lunule: the cilia are white intersected with black." This form was said by Petiver to have been fairly common in Cain Wood in his time!

There remains a named form, difficult to place with certainty, but which may possibly belong to *athalia*, viz., *veronica*, Dorfmeister. We first find this name in the 'Verhandlung des zoologischen-botanischen Vereins in Wien,' vol. iii., p. 136 (1853), where Dorfmeister merely says that this form is near to *dictynna*, but gives no further account of the imago, which he was evidently exhibiting and left to speak for itself. He gives a short description of the larva and pupa, and for comparison an equally short description of those of *athalia* and *parthenie*, the total outcome of which seems to be that he was quite unacquainted

* There is a reference in the 'Illustrations' to the same author's 'Catalogue' which was not published till 1829, which is somewhat puzzling. I can only conjecture that Stephens was occupied on both at once, and that the earlier part of the Catalogue was written at this time, though not published.

with *parthenie* in any stage. For over forty years there seems to have existed only the most nebulous idea of this form, but in 1896 Hormuzaki described it from two of Dorfmeister's specimens in the same magazine, vol. xlv., p. 233. (This page is wrongly quoted as 341, both in Staudinger's 'Catalogue,' and in Hormuzaki's own article in 'Iris,' xi., p. 7). Much of this description is unavailable, because it is a comparison with a specimen bred from a Regensburg larva, and supposed to be *britomartis*, but the correct designation of which does not appear with any certainty from the description. There can, however, be no question that Hormuzaki was acquainted with Dorfmeister's *veronicae*, and there exists in the national collection at South Kensington a specimen of the latter identified by him, a female, from which the following description is made:—

Up. s. f. w.: border broad, lunules small, the third being the most prominent; outer subterminal rather broad, inner rather broader and curving outwards at inner margin; elbowed line narrow; marginal blotch outlined, and showing much of the ground colour, speckled with black scales; stigma outlined, oval, with many black scales; space between basal lines filled up with blackish; basal suffusion extends along inner margin as far as elbowed line.

Up. s. h. w.: narrow lunules of ground colour within border; darker ones, still small, within the outer line; basal suffusion extends over the rest of the wing, except a few dots within the inner line, one spot within what would, if not included in the suffusion, be the extra line, and the basal spot.

Un. s. f. w. Markings very indistinct, except the outer subterminal; inner subterminal and elbowed line indicated only by marked costal dots, the other spots which form them only slightly showing through from up. s.; marginal blotch small and square, the other markings narrow but clear; inner edging line of border angulated between the nervures.

Un. s. h. w.: inner edging line of border slightly angulated; lunules pale; outer band with palish lunules, and the inner part dark and broad; central band with the outer part not much paler than the inner, and with the third and fourth spots projecting but little; inner band darker than outer; fourth spot of basal band absent, fifth present.

This fifth spot of the basal band, is that which is spoken of by some of the German writers as the light (or white) spot at the anal angle; in his description of *veronicae* in 'Iris' Hormuzaki states that this spot is silvery white, but it is not so in this specimen. He also speaks of the striking contrast between the colour of the marginal lunules and the darker external border, which he describes as being reddish-yellow in the male, and dark lemon in the female. This contrast certainly exists in the specimen under notice, but can hardly be called striking. In the South Kensington collection several other specimens are placed with this, whose general facies leaves no doubt as to

their belonging to the same form, but all these have the upper side darker, with broader black markings (except the inner sub-terminal), and with a distinctly broad black border; the outer and inner bands of the un. s. h. w. are darker, whilst the dark markings on the un. s. f. w. are slighter.

It is difficult to place this form, and it is with considerable diffidence that I have put it among the varieties of *athalia*, as it shows in several respects a somewhat close affinity with *aurelia*; and it is quite probable that when the life histories of both are carefully worked out it may prove to be a variety of *dictynnoïdes*.

(To be continued.)

FIVE WEEKS IN THE VOSGES.

By A. E. GIBBS, F.L.S.

(Continued from p. 85.)

ANOTHER pleasant excursion was made on the 10th of the same month to the Valley of the Ognon, in the department of Haute Saône, taking train to Le Thillot and driving over the col to Le Haut du Them. While the driver was baiting his horses at the hotel at the top of the pass, *Issoria lathonia* flew by, and I chased it over the departmental boundary and captured it in Haute Saône. We drove down into the valley at a spanking pace, and arrived at the station half an hour before the train was due to leave, so we decided to walk to the next stopping place. On the way we beat out our first specimen of *Arachnia levana* var. *prorsa*, but it flew across a potato patch where a dame of forbidding appearance was at work with her hoe, so we let it escape, but met with the species again among some nettles near Ternuay, to which place we took the train at a wayside station. From Ternuay we walked down the valley to Melisey. In the clover fields *Colias edusa* and *C. hyale* were flying, and another dwarf in the shape of a diminutive specimen of the former insect fell to my lot. The commonest butterfly in the valley was undoubtedly *Leptosia sinapis*, which, being just out, was in the pink of condition, and next to this graceful little Pierid in point of numbers came *Brenthis dia*, which was flying by the roadside everywhere. Near Melisey, on a strip of green-sward, we made acquaintance with *Everes argiades*, of which four specimens, evidently of the second brood, came our way. I afterwards met with this insect at several places on the lower levels, but it was not until the 21st of the month that I saw it at St. Maurice which is at a higher altitude. Except for the fact that they are rather large, the specimens taken in the Vosges are quite typical. The two Chrysophanids seen during the day

were *C. alciphron* and *C. phlæas*. I again penetrated into Haute Saône on the 23rd July, when I explored the valley of the Breuchin as far as the fashionable spa of Luxeuil-les-Bains, again partly by train and partly on foot. Unfortunately, I was alone on this excursion, as Mr. Barraud had to return to England on July 13th. Crossing the mountains from Rupt-sur-Moselle, I walked down to Correvillers, taking a very fresh *Euvanessa polychloros* as I neared the village, whence I booked to Luxeuil, but a tempting bit of woodland induced me to hurriedly leave the train at a stopping-place. *Pararge megera* was fitting in and out of the bushes on the margin of the wood, and *Colias edusa*, like a flying blossom, sailed over the more open ground. Taking a forest path which appeared to lead in the right direction I soon found myself lost in a maze of umbrageous ridings, where the thick foliage of the beeches and oaks afforded a pleasant shelter from the fierce rays of the mid-day sun, but brought no game to the bag. Emerging at length on a stretch of heath land I got my bearings and also a nice example of *Chrysophanus dorilis*, an insect with which I was to become more familiar later on. Enquiring at a woodman's cottage, I was shown a quick way to Luxeuil, and just before entering the town, in a small meadow, three more *C. dorilis* were taken in company with *Nomiades semiargus* and *Polyommatus alexis*.

The very useful map of the district published by the Syndicat d'Initiative des Vosges showed that a considerable stretch of forest land was to be found in the neighbourhood of Charmes, a small country town on the main line to Paris, between Epinal and Nancy, so I determined to visit the spot, hoping to find *Apatura ilia*, *A. iris*, and other woodland species. On the night of July 13th Mr. Barraud started for home, and we travelled together to Epinal which was as far as I could get that night. At an early hour next morning I alighted at the station at Charmes, and made for the forest, which could be seen on the west of the line. Rain had fallen heavily, making everything very wet, but an occasional gleam of sunshine awakened the hope that despite the gale which was blowing something good might be found. In an old grass-grown pit outside the forest a few *Everes argiades* and *Nomiades semiargus* were trodden up. Then *Pieris napi* and the ubiquitous *Leptosis sinapis* were met with in a forest glade where the long wet herbage made progression very uncomfortable, but I struck the railway and followed a track running between the line and the woodland, where *Cænonympha arcania* was discovered at rest, and a batch of ova of *Bombyx rubi* was found on a leaf of wild raspberry. By the time I had reached a point where the railway crossed the high road, old Sol had temporarily gained the upper hand, and a brilliant male *A. iris* settled on some horse-droppings awakened expectations. But *iris* is a wary insect and

very difficult to approach. A gleam of purple wings and he was gone. So long as the sun shone I saw a considerable number of both the Apturids I was in search of, but they circled round the tree-tops quite out of reach, and on their occasional descents to earth were too cautious to come within reach of the net, approach one never so gently. However, after a great deal of running about in the hot sun, two *A. iris* and one *A. ilia* var. *clyte* were secured, and a pair of *Pararge achine* disturbed from the hedgerow. A worn female *Limenitis sibylla* was ovipositing on the honeysuckle, and about a dozen eggs rewarded my search, but they all proved infertile. Unfortunately, the elements were fickle and rain soon began to fall again. Shelter was found under a tree, but as there were no signs of clearing up, I reluctantly abandoned hope and made the best of my way back to Charmes, where, after a three miles walk, I found an hotel with an English-speaking landlord, a *rara avis* in these small French towns. Rain continued to descend steadily for the greater part of the afternoon, so that there was nothing to be done except sit in the cafe, where I found another weather-bound traveller engaged in entomological pursuits. He was a fisherman, and was beguiling the time catching flies which he wrapped carefully up in paper to use as bait. A few turns of my net got him as many specimens of *Musca domestica* as he wanted. Between three and four o'clock, as it cleared up a little, I determined to again try my luck. This time I took another road to the forest, only to get a few *Everes argiades*, *Cupido minima*, *Lycæna arion*, and *Leptosia sinapis*, the two former insects being found at rest on the broom, a rather curious resting habit for insects with such light and therefore conspicuous under sides to adopt, because it makes them very clearly visible from a distance, hanging from the dark green shoots of the genista. On the way to Rambervillers, where the night was spent, I noticed fine stretches of woodland, and the next morning returned a few miles along the line, but hardly had I left the train and got into the forest than a heavy shower fell, which spoiled my chances of finding many insects on the wing. Everything was so wet that I got on to the line and walked along the permanent way until I came to an inviting-looking green lane where the capture of a butterfly entirely fresh to the list in the shape of *Enodia dryas*, male, rewarded my exertions. Vain was the search for other specimens, but the morning's work resulted in the acquisition of two *Pararge achine*, two *Cænonympha arcania*, two *Brenthis dia*, two *Everes argiades*, and single specimens of *Limenitis sibylla*, and *Thecla ilicis* var. *cerri*, with a few flies of lesser note, making a total of fourteen in all. It was not until July 29th that I was able to do any more entomological work at Charmes, but the story of that expedition may well be told here. Behind the town to the east rises a hill which is a landmark for the

whole country side. I had arrived in Charmes on the previous night, and as the morning broke dull and cloudy I resolved to see what could be found on the hillside rather than repeat my experience of a wet walk in the forest. Crossing the meadows behind the town I disturbed a few specimens of *E. argiades* and *N. semiargus*, and then making a bee-line for the top through the vineyards saw a solitary specimen of *Pyrameis cardui*, the only record I have of its occurrence in the Vosges. In some disused quarries on the crown of the hill, besides the two "blues" already mentioned, *Polyommatus corydon* and *Rusticus argus* (*ægon*) were met with. A very pretty lightly-marked example of *Abraxas grossulariata* was caught on the way home. The afternoon being a little brighter the forest was again visited, but on the road where a fortnight before *Aptura iris* and *A. ilia* were abundant, not one was now to be seen. About four o'clock, when I got into the open country again, the sun came out for an hour and sport was very good. On the clumps of wild thyme *Chrysophanus dorilis* was much in evidence, and its congener *phlæas*, fresh and bright, spread its golden wings in the sunshine. *Colias hyale* was flying freely, but *C. edusa* did not put in an appearance, though I met with it on the following morning, which I spent on the outskirts of the forest in a more northerly direction, when the Lycænids already mentioned were the chief objects of attack, a good series of *C. dorilis* being quickly obtained. Altogether my visits to the forests on the lower levels were most unfortunate, the weather being showery on each occasion, and the atmospheric conditions generally not favourable for collecting.

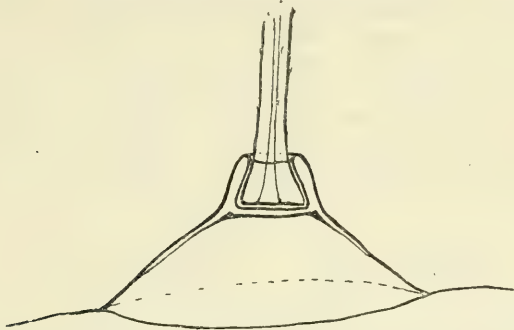
(To be continued.)

LARVA OF ARGYNNIS LAODICE.

By T. A. CHAPMAN, M.D., F.Z.S., &c.

MR. FROHAWK'S account of the life-history of *A. laodice* (*antea*, pp. 49-54, pl. ii.) is so excellent, and his plate seems to me to deserve such an overwhelming meed of praise, whether as regards accurate and scientific entomology or as a most beautiful example of the painter's art, that I hesitate to make a trifling comment thereon. I do so, however, just because it is so good, and therefore possesses, because it deserves, such great weight, that it seems desirable that weight should not be given to even a trifling inaccuracy. This affects the hairs as shown on the enlarged drawing of a segment of the first stage larva. Tubercles ii. and iii. are shown with an expanded scutcheon, and a hair, and between them a bulbous portion, no doubt that referred to in the description as a "bulbous base" of the hair. The figure, then, shows three portions—the tubercular scutcheon, the bulb, and the hair. Now, I have never

seen the young larva of *laodice*, but other Argynnids, and, in fact, all larvæ, show only two structures, the basal scutcheon and the hair. In these Argynnids the hair descends into the scutcheon, and expands a little within it, to the distance and amount of the "bulbous base."



The basal margin of the "bulbous base" is internal to the scutcheon, and may be seen through its transparent structure, but there is no structural line on the outer surface of the scutcheon such as the figures give. The other tubercles have precisely the same structure.

THE ANTIPODEAN GENUS *PROBOLOIDES*, MORL. A CORRECTION.

BY CLAUDE MORLEY, F.Z.S., F.E.S.

In the first volume of my 'British Ichneumonons' I described two species under a new genus, *Proboloides*, which is certainly valid; but unfortunately there can, I am assured, be no doubt regarding the origin of the insects placed therein. They are from New Zealand, not Britain! Their right to inclusion in our fauna was certified by no less an authority than Rev. H. S. Gorham, and I, consequently, had no hesitation in bringing them forward as indigenous. I had seen no more till last month, when I discovered the same species in the National Collection. They should stand:—

PROBOLOIDES SOLLICITORIUS, Fab.—*Ichneumon sollicitorius*, Fab., Syst. Ent. 332; Spp. Ins. 425, ♂ (type in Mus. Brit.).
Ichneumon invectus, Smith, Trans. Ent. Soc. 1876, p. 475, ♀ (type in Mus. Oxon). *Proboloides glabratus*, Morl., Ichn. Brit. i. (1903), 161, ♂ ♀ (type in Mus. Morl.).

PROBOLOIDES DECEPTUS, Smith.—*Ichneumon deceptus*, Smith, Trans. Ent. Soc. 1876, p. 477, ♀ (type in Mus. Brit.); Cameron (in Mus. Brit.). *Proboloides maculatus*, Morl., Ichn. Brit. i. (1903), 161, ♂ ♀ (type in Mus. Morl.).

I at once wrote to Mr. Gorham respecting their origin, and

he kindly replied (*in lit.*, 15th March, 1909):—"I can say that of my own knowledge I never had any ichneumons from New Zealand or any other country in my possession. If I had taken them out of any box of foreign insects, I am sure I should have marked them so: I am very particular on such points. I should have told you if I had any doubt. My impression is that they were some I took in the New Forest; but I say this with reserve, as it is only a guess." We must, nevertheless, regard them as antipodean, and suppose they had found their way into Mr. Gorham's collection from some of the numerous boxes he so frequently receives of *Malacoderma* from all parts of the world.

NOTES AND OBSERVATIONS.

A MORNING AT AMELIE-LES-BAINS, PYRÉNÉES ORIENTALES.—Arriving here in the afternoon of April 6th, a short walk showed that the season was not so far advanced as it usually is at Hyères at this date. The blackthorn was in full bloom, only an early bush here and there going over. Almonds apparently over, but peaches in full flower; cherries, some fully out, but many only just in bud. Here and there plums and pears in flower, some patches of lupins flowering; but for the most part things had a very bare wintry aspect; a sharp but hardly cold wind helped me to regard things as a little inclement. The snow on the Canigou was very low down. The highest point is not apparently visible from Amelie-les-Bains, and the outline is somewhat irregular; still the lofty snowy slopes dominating the landscape, whenever it formed part of it, compelled us to recognize a certain resemblance to the view of Etna from Taormina before its winter snows are melted, but the smooth conical outline of Etna gives it a majesty less obvious in the Canigou. On the 7th the weather was perfect, with little or no wind. A walk up the sunny side of the valley of the Teche showed that a good many butterflies were already on the wing. *Ægeria* was very frequent, and was the only species that was certainly going over, not one specimen in fair condition being seen. *H. megæra* was more common, females scarce, males generally but not always somewhat worn. *P. rapæ* was common, but *P. manni* was not detected. *L. argiolus* was frequent, generally worn; *L. baton* in fine condition, just coming out. Several *A. lathonia* were seen, of rather small size, one very small; several *C. edusa* were seen, but not taken; *S. cleopatra* was not very common, but afforded its welcome and brilliant contribution to the landscape not unfrequently. *P. feisthamelii* was frequently seen; a habit of assuming that *P. podalirius* was not worth catching, and in any case could be got in any numbers if required, may account for the circumstance that seeing it and catching it proved to be by no means synonymous. A single specimen of *L. celtis* was taken; no tree or plant of *Celtis australis* could be found, but one or two were afterwards found close to the hotel. *L. sinapis*, *P. daphidice*, *V. io* and *P. atalanta*, and *S. alceæ* complete the list of insects seen. No speci.

men of *Euchloë* was seen, nor was *T. ballus* met with, nor *T. cassandra*. What may appear as the season advances remains to be seen. The locality is clearly one not to be despised, though this first sampling suggests that it has neither the richness nor variety of Hyères.

A further week's stay results in a marvellous advance of vegetation being observed; trees are green instead of brown, the horse-chestnut almost in flower. One still notes the absence of any *Euchloë*, of *Thais cassandra*, and of *Thestor ballus*. No ground suitable for either of the latter has been noticed. *L. baton* is abundant in places, *T. medesicaste* frequent, and *L. celtis* more often seen than the rarity of its food-plant would make one expect. Another notable absentee is *P. cardui*; but *V. polychloros* is almost abundant, and *io*, *atalanta*, *urticeæ*, *antiopa*, and *c-album* frequently occur. *T. tages* and *C. phlæas* are frequent, and *mæra*, *machaon*, *melanops*, and *pamphilus* have put in an appearance, with *T. rubi* common in places. *L. sinapis* is now abundant, and may frequently be seen ovipositing on *Dorycnium suffruticosum*.—T. A. CHAPMAN; April 14th, 1909.

GENITALIA OF THE NOCTUIDÆ.—Some expressions in the notice of Mr. Pierce's volume (Entom. April, 1909) suggest that your reviewer has overlooked the excellent work of Elwes and Edwards on the Oriental Hesperidæ, and especially the very complete examination recorded in the 'Biologia' of the appendages of the Hesperidæ of Central America.—T. A. CHAPMAN; Betula, Reigate, April 2nd, 1909.

THE ENTOMOLOGICAL CLUB.—A meeting was held at Wellfield, Lingards Road, Lewisham, on March 12th last. Mr. Robert Adkin in the chair. Other members present were Messrs. Donisthorpe, Hall, and Porritt, and there were several additional guests.

HONORARY MEMBERS OF THE ENTOMOLOGICAL CLUB.—Prior to 1850 Honorary Members of this ancient Club are not clearly indicated, but from the beginning of that year and up to the present date, the records show that, in addition to those who afterwards passed to ordinary membership, the following were duly proposed and elected:—

- 1850. Mr. William Yarrell and Mr. William Wilson Saunders (Jan. 17th).
- 1851. Herr Dohrn (May 17th). Mr. Frederick Smith (Nov. 15th).
- 1852. Mr. Able Ingpen (March 20th).
Mr. Robert Warrington (May 15th).
- 1853. Mr. J. W. Douglas (Feb. 19th).
- 1859. Mr. George Lewis (Nov. 22nd).
- 1861. Mr. Edward Caldwell Rye (March 19th).
- 1862. Mr. A. R. Wallace (returned to Club card, July).
- 1863. Mr. H. W. Bates (reinstated Oct. 21st).
Mr. Francis Polkington Pascoe (Nov. 24th).
- 1866. Mr. Edward W. Janson (June 20th).
Mr. William Borrer (Oct. 17th).
- 1867. Mr. Joseph W. Dunning (Feb. 20th).
- 1871. Mr. Charles Horne (Feb. 15th).
- 1879. Mr. Edgar Smith (Oct. 22nd).
- 1891. Mr. Richard South (Dec. 11th). Appointed Hon. Sec.,
Nov. 24th, 1897.

1908. Mr. Alfred Sich (Jan. 14th).
Mr. Albert H. Jones (Dec. 8th).

RECENT SALES OF LEPIDOPTERA AT "STEVENS'S." — In the last issue of the 'Entomologist' (p. 101) reference was made to some varieties, which, looking at the prices they realized, were the gems of the Maddison Collection.

To deal with all the other more or less interesting aberrations would occupy more space than is available for the purpose, so reference can only be made to those that appear to be most noteworthy.

A specimen of *Papilio machaon*, with all the markings diffused, 18/-. A curious leaden-coloured specimen of *Pieris brassicae*, 10/-. A bright buff, almost orange-coloured, *P. napi* from Donegal, 21/-. Three aberrations, put up separately, of *Euchloë cardamines* sold for 70/-, the best of the trio being a male without discal spot; this made two guineas. A queer looking specimen of *Gonepteryx rhamni*, with the right fore wing and part of left fore and hind wings male, made 55/-; and a pure white female of the same species 25/-. Eleven aberrations of *A. paphia*, offered singly, brought in £17 6s. The lowest sums given were 5/-, 10/-, 10 6, and 18/-, and the higher 32 6, 35/-, 37 6, 40/-, 45/-, 55/-, and 57 6. A var. of *A. aglaia* with suffused markings, one with large black blotches, and other examples of the species, 80/-. A dark male *A. latona*, taken by the late Mr. S. Stevens near Dover, September, 1872, made 50/-. One example of *A. euphrosyne* with very dark hind wings (Abbot's Wood, 1899), 22/-. A white var., two suffused dark specimens, and eight other examples of *A. selene*, 70/-. An aberration of *Melitæa aurinia*, fore wings black, with a row of fulvous hind marginal spots (Abbot's Wood, 1903), 95 -. Another example of *M. aurinia*, rayed under side, basal half of hind wings dark, outer light, 50/-. A specimen of *Polygonia c-album* with large black patches on all the wings, 30/-; and one with the hind wings and the outer margins and costa of fore wings very dark (Wye Valley, July, 1906), 80/-. Six *Vanessa antiopa* realized 94/-, the price per specimen ranging from 10/- to 18/-. Two exceptional varieties of *V. urticae* made £7 15s., and four other nice aberrations of this species brought in 62/-. Four specimens of *V. io* with aberrant eye-spots sold at 15/-, 21/-, 21/-, and 40/- each.

A variety of *Pyrameis atalanta* with the band much interrupted, and a large white blotch on the fore wings (Isle of Wight, August, 1901), 40/-; whilst another specimen, a very fine under side var., much suffused on both upper and under sides, also from Isle of Wight (August, 1901), £5.

Eight nearly black varieties of *Limenitis sibylla* were put up in couples, and made 10/-, 12/-, 32/6, and 40/- per lot. A single specimen with obscure bands and red spot on fore wings sold for 35/-, and a velvety black example went for a guinea.

Two aberrations of *Satyrus semele*, one of which was a white form from Swanage, 1905, 40/-. A very pale variety of *Epinephele ianira*, cream coloured, with orange suffusion on fore wings, 22/-; one almost white (Folkestone, 1890), 42/-.

Seventeen specimens, offered singly, of *Chrysophanus dispar* realized £64 5s., the highest price per specimen being 110/-, female, and the lowest 25/-, male.

Two vars. of *C. phlæas*, one of which was the silvery form, brought two guineas; one aberration with large black spots on the fore wings, together with one pale form approaching *ab. schmidtii*, sold for 16/-; another with large spots forming band on the fore wings, 30/-. Eighteen other varieties of *C. phlæas*, comprised in five lots, made 117/-. The best varieties of *Lycæna bellargus* and *L. corydon*, offered in twos, sold at from 10/- to 35/- per lot. Gynandrous *L. icarus*, of which there were four examples, ranged from 27/6 to 40/- each; two under side aberrations of the same species, with large spots and streaks on all the wings, made 32/6 and 40/- respectively.

Ten *L. acis*, taken at Glanville's Wootton, were sold in pairs at from 10/- (under sides) to 30/-; one example of the same species, with three aberrations of *L. ægon*, made 20/-. Four gynandromorphous specimens, from Dover, of *L. ægon* ran the bidding up to 65/-.

Hesperia malvæ ab. taras, of which there were a dozen examples, made about 1/6 each; and a series of thirteen specimens of *Carterocephalus palamon*, including some striking aberrations, realized 28/-.

Among the Sphingidæ, the most important items were *Hyloicus pinastri*, of which species two Suffolk specimens sold for 8/- and 10/-. Hybrid *Smerinthus ocellatus* ♂ × *S. populi* ♀ made from 10/- to 22/- each. A dark sage-green coloured *S. populi* and a rosy aberration of the same species yielded 84/-. A gynandrous *S. populi* (right side male, left female) sold for 30/-. A red variety of *Dilina tiliaæ*, with dark hind wings, 21/-, and an "hermaphrodite" of the same species, 10/-.

Of Zygænidæ there were a few good forms, the best of these being *Z. meliloti*—one yellowish pink and two confluent vars.—7/-; *Z. trifolii*, two lots, each containing one yellow aberration and one pale with confluent spots, 8/- per lot. Three lots, each comprising one yellow and one yellowish pink *Z. filipendulæ*, 16/- per lot.

Long series of Sessiidæ, about two hundred specimens in all, sold for rather less than £5.

Among numerous aberrations of *Arctia caia* (other than those previously mentioned) the most noteworthy were—one with unicolorous deep brown fore wings and jet-black hind wings, £5 10s.; one "fore wings all brown with white markings showing faintly, hind wings jet-black with inner marginal fringe pink," £3 15s.; a remarkably pale specimen with light brown and yellow markings on a cream ground, £3 10s. The best of the varieties of *A. villica* sold for 21/-, 32/6, 45/-, 65/-, and 95/- each; and a couple of aberrations, one with large apical blotch and the other with smoky hind wings, made 60/-. Eight pairs of *Lælia cænosa* realized from 8/- to 16/- per pair; two not very good males were bought for 10/-, and three poor specimens made 15/-. A pair of *Drepana harpagula (sicula)*, from Leigh Woods, sold for 20/-; four females from the same locality made 28/-; five other examples of the same sex made only 17/-.

There were twenty-two specimens of *Cerura bicuspis*; twelve of these, from Tilgate, sold in threes at 6/- and 7/- per lot, and the others at about same rates. An odd example of *Saturnia pavonia*, with female fore wings and male hind wings, the latter with streak of the female colour, fetched 50/-. Twenty-seven examples of *Acronycta strigosa* and twenty-five *A. auricoma* averaged 2/- to 2/6 apiece. A

series of *Leucania favicolor*, including yellow, reddish ochreous, and red forms, were offered in five lots, and made £3 17s. Eight *Tapinostola concolor* (Hunts) and sixteen *Nonagria "neurica"* (Cambs), with other things, went for 23/-. A similar lot of *T. concolor*, with twelve "*neurica*," five of which were melanic (from Horning), made 37/6. Two examples of *Luperina dumerilii* (Rainham, 1895, ex Burney coll.), put up with sixty specimens of other species, were sold for 6/-. Six *Crymodes exulis* from Shetland, sold in couples, realized 97/6; and four others from Rannoch (var. *assimilis*), 63/-; two from Perthshire and one from Unst made 45/-; five others from Unst, with series of *abjecta* and *furva*, sold for 46/-.

A specimen of *Hydrilla palustris* from Wicken Fen, together with an example (ex coll. Hodgkinson), made 20/-; two others, one of which was from Cambridge, 20/-; and a pair (female, Ringwood, Hants), 16/-.

The collection of British Lepidoptera formed by Mr. C. H. Schill, and also that of Mr. A. M. Smallpiece, were sold on January 26th last. In the first-named collection there were four specimens of *Chrysophanus dispar*, one of which, a large female, made 80/-, a large male sold for five shillings less; a male (Tugwell coll.) went for 40/-, and another (Chapell coll.) 22/-. One pair of *L. cænosa* made 30/-, and another pair 14/-. An unusually fine male specimen of *N. subrosea* realized £5. The most important items in the Smallpiece collection were:—Two aberrations of *Argynnis paphia*, reared by L. W. Newman in 1908 from New Forest ova; the male made 40/-, and the female £5. A very rubbed black ab. of *Limenitis sibylla* sold for 7/-. Four examples of *Leucania vitellina* (Kent, Devon, and Brighton), 19/-. Ten *Caradrina exigua* sold at from 1/6 to 3/- each, and eight *A. alpina* (Rannoch) 17/- the lot. Four fine *Crymodes exulis* (Shetland) made 32/6 and 28/- per couple, and eight others from the same locality, 46/-. Two Sussex specimens of *C. gnaphalii* fetched 17/-. Of varieties of *Abraxas grossulariata*, the best five brought in a total of 100/6.

We are indebted to our colleague Mr. R. Adkin for the following:—Yet another sale has been held, the collection of Lepidoptera formed by the late Mr. J. Pardoe being dispersed at Stevens's on March 23rd. The specimens were as a rule in good condition, but for the most part lacked data. The more notable lots included seventeen specimens of *Polyommatus dispar*, which sold for a total of £38 8s., the highest price obtained for single specimens being £5 for a fine female, £3 15s. for a fine male, and £3 10s. for a fine under side male, and the lowest, 16/-, for a rather poor male. A remarkably large and fine specimen of *Deiopeia pulchella*, taken by Mr. W. J. Austen at Folkestone, August 14th, 1892, brought 25/-, and two *Crymodes exulis*, taken at Rannoch, £2 5s. Less authenticated specimens brought poor prices; thus lots 1, 2, and 3, each containing among other species three specimens of *Pieris daphidice*, realized an average of 4/- per lot; eleven *Argynnis latona* brought a total of 10/-. Two lots of fifty "*blues*," each including four *Lycæna semiargus*, sold for 3/- per lot; while five *Deilephila euphorbiæ* failed to find a bidder until linked with three *D. livornica*, when they were knocked down for 4/-.

CAPTURES AND FIELD REPORTS.

PHIGALIA PEDARIA ab. MONACHARIA.—Ten or twelve years ago I took an example of this melanic aberration in Charnwood Forest. In 1908 I took another specimen in the same locality, which I brought home and placed in a breeding-cage, a roomy contrivance with many chinks, with a typical female that had emerged from a larva taken in the same wood. I did not notice that they paired, but subsequently I found a few eggs laid around and in the groove of a screw-head and in a joint adjacent to it. It was hardly possible to get at these, and I waited till they hatched, as a result of which some doubtless escaped; at all events I only reared some two dozen larvæ or thereabouts. The moths emerged in March last from 18th to 23rd, with the exception of a single male which appeared on Feb. 21st, after which a long spell of cold weather ensued. The sexes were in equal proportion, eleven males and eleven females. Of the males four were ab. *monacharia*, seven were typical, and there were no intermediate forms; of the females eight appeared to be more or less typical—that is, the under side was copiously sprinkled with pale grey or whitish, but the abdomen above in two examples was brownish, in six blackish. The three remaining specimens were black above, and the light grey powdering beneath was confined to the thorax and legs, the under side of the abdomen being uniformly dark grey or blackish. I was able to pair two of these dark females with black males and obtained ova, and I also paired a couple of typical males and females of the same stock. If I am successful in rearing the progeny, the results will be of some interest. This black variety or aberration of *P. pedaria* extends apparently over a considerable area in the county of Leicester. It has been taken at Knighton on the outskirts of Leicester, and, I think, also at Market Bosworth by Mr. F. Bouskell, and in Charnwood Forest, as mentioned above. An example has also been reported this year from Measham, in the extreme north-west of the county.—(Rev.) W. G. WHITTINGHAM; Knighton Vicarage, Leicester.

AMÆBE OLIVATA IN APRIL.—A newly emerged *Larentia (Amæbe) olivata* at Beaconsfield, April 18th.—C. G. DOUGHTY; 27, South Molton Street, W., April 19th, 1909.

BREPHOS PARTHENIAS AT SALLOW-BLOOM.—This pretty moth came freely to willow-catkins in Delamere Forest, April 10th. From a solitary bush, with a net fixed to the end of a bamboo eight or ten feet long, I could have taken thirty to forty specimens in a couple of hours, possibly more. Their chief feeding-time seemed to diminish towards noon. The exceptional numbers on this occasion were doubtless due to the warm, sunny day. A *Vanessa urticae* also paid a lengthened visit to the same bush.—J. ARKLE; Chester.

HYBERNIA MARGINARIA var. FUSCATA.—This variety occurs frequently in Leicestershire, but the proportion of the true variety, uniformly dark brownish with the markings imperceptible or nearly so, is not greater, as far as my observation goes, than five per cent. It varies in the depth of the colour. Examples, however, are much more common in which, while the markings are conspicuous, the

wings are clouded with darker patches, particularly in the hind marginal area. Last year I found a dark female, and obtained a *fuscata* male to pair. A good many of the resulting larvæ died, and I only reared eighteen examples, which emerged last March. Curiously everyone was a female; only four of these were typical. The remainder were all dark in body and wing; in three examples almost uniformly rich dark brown nearly black, but with the lines perceptibly blacker, the rest have a somewhat less dark hind marginal area. I obtained again a pairing with a wild *fuscata* male, and have, as a result, a batch of eggs.—(Rev.) W. G. WHITTINGHAM.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 3rd, 1909.*—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. Francis Hamilton Lyon, of Addlestone, Surrey, was elected a Fellow of the Society.—Mr. L. B. Prout, on behalf of himself and Mr. A. Bacot, brought for exhibition a very extensive series of *Acidalia virgularia*, Hb., bred in ten successive generations from various crossings of the London and Hyères race, which had been undertaken with a view to the further study of Mendelism. The results showed non-Mendelian inheritance, there being no segregation with pure and hybrid forms in definite proportions, thus supporting Mr. Bacot's opinion that such were only to be expected in cases of hybridization of forms in which Natural Selection had virtually eliminated intermediates. A discussion followed in which Mr. Bacot, Dr. T. A. Chapman, Mr. G. Meade-Waldo, and the President took part, Mr. A. Harrison pointing out that in similar experiments conducted by himself with Mr. H. Main with British *Pieris napi* × *P. var. bryoniae* from Switzerland carried through three generations, they had quite failed to obtain Mendelian proportions, but in the case of *Aplecta nebulosa* the Mendelian proportions were absolute.—Mr. H. M. Edelsten showed a living pupa of *Pieris rapæ* attached to a blade of *Clivia*, the deep green pigment assimilating closely to the coloration of the leaf.—Mr. R. Adkin exhibited what appeared to be a hybrid between *Zygæna filipendulæ* and *Z. achilleæ*, taken by Mr. A. W. Renton in the neighbourhood of Oban, N.B.—Mr. J. W. Tutt expressed his opinion that the form was an aberration of *Z. filipendulæ*, and said that in nature the two species were unknown to pair.—Mr. Hamilton H. Druce, F.L.S., F.E.S., communicated a paper "On some new and little known Hesperiidæ from Tropical West Africa."—Mr. G. A. K. Marshall, F.Z.S., read a paper entitled "Birds as a Factor in the production of Mimetic Resemblances in Butterflies." He explained that one of the chief criticisms directed against the theories of mimicry was to the effect that, on the whole, birds did not destroy butterflies to any appreciable extent; he had therefore collected together all the available evidence bearing on the question. It was contended also that the negative evidence on this subject, which appeared to have been very generally accepted, was really of very little scientific value, because in no case had it been shown that the observer had any adequate knowledge of the actual

food-habits of birds, or that any careful and exhaustive inquiry had been made into the subject. Instances were also cited to show how very easily destruction of this kind might be overlooked; while negative evidence derived from an examination of the contents of birds might be very misleading, owing to the fact that in so many instances the butterflies' wings are not swallowed, so that any recognition of the remains becomes extremely difficult. Finally, it was urged that the large body of evidence resulting from merely casual observations indicated that the assumption that birds do not eat butterflies to any extent is certainly premature, and that a fuller inquiry will probably show it to be entirely unfounded. A discussion followed in which Mr. A. W. Bacot, Mr. H. Rowland-Brown, Mr. H. Main, Mr. A. E. Tonge, Mr. H. M. Edelsten, Mr. J. W. Tutt, and other Fellows gave their experiences on the subject, Mr. W. Sharpe maintaining that the actions of the sparrow, as a domesticated bird, was not evidence for conditions which exist in the case of purely natural species. Dr. T. A. Chapman suggested that the paucity of observations on the point was largely due to the shyness of birds eating in the presence of human beings. Mr. W. J. Kaye said that he had never observed birds attacking butterflies in Tropical South America, and Commander J. J. Walker gave similar testimony with regard to the many Australasian and other oversea localities visited by him.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

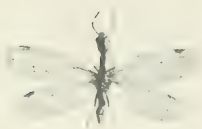
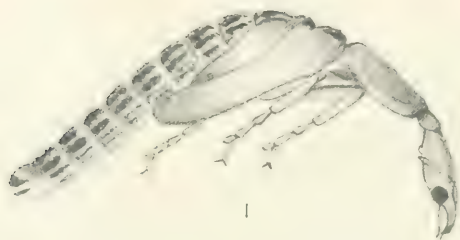
THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 11th*, 1909.—Mr. A. Sich, F.E.S., President, in chair.—Mr. Bauman, of Chingford, was elected a member.—Mr. Newman exhibited portions of the stems of *Viburnum* and pointed out the evidences showing that the larvæ of *Ægeria andreniformis* were present. They were found in a shady locality.—Mr. Tonge, stereographs of the ova of *Tiliacea citrargo* in situ on lime twigs, and of *Ruralis betulae* on sloe.—Mr. Main, a second brood specimen of *Melampias epiphron*, bred on Sept. 20th, 1908; a very light example of *Stauropus fagi* from the New Forest, and a very dark form from Epping Forest.—Dr. Hodgson, a dark, smoky specimen of *Brenthis selene* from E. Sussex, with rayed submarginal markings.—Mr. Coote, bred and captured specimens of *Calymnia pyralina*.—Mr. R. Adkin, a series of *Campptogramma fluviata* bred from Nov. 21st to Dec. 13th last, from Eastbourne.—Mr. Harrison reported that the results of the cross breeding of the forms of *Aplecta nebulosa* by Mr. Mansbridge, were *grey* × *thompsoni* = all *robsoni* and *robsoni* × *grey* = fifty per cent. each of these forms. A long and interesting discussion took place as to the oviposition and early life of the lava of the *Ægeriids*. It was noted that in the first instar the larvæ of several species were hairy and presumably external feeders.

February 25th, 1909.—The President in the chair.—Mr. Stone, of Clapham, was elected a member.—Dr. Hodgson exhibited a series of *Nemoria viridata* taken in 1906–8 in Lancashire and Surrey, and commented on the forms shown, including ab. *concavilinea*. He also showed a third brood specimen of *Celastrina argiolus* in which the blue was almost wholly replaced by dull grey.—Mr. West (of Greenwich), a cabinet drawer of Coleoptera, the first of the rearrangement of the Society's Collection.—Mr. Main, for Mr. Baldock, a yellow

variety of *Euchelia jacobææ* from Norfolk, and three fine specimens of the rare *Papilio mechowianus* from Central Africa.—Mr. McArthur, specimens of *Anarta cordigera* from Rannoch, and read notes on its habits and habitat.—Mr. H. Moore, a gynandrous example of *Papilio clearchus* (?) from S. America, right side male, left side female.—Mr. Newman, *Aglais urticae* var. *ichnusa* with sagittate blue spots on the hind margin, *Dryas paphia* with much raised black markings, "black" *Limenitis sibylla*, a straw-coloured variety of *Rumicia phleas*, the unique pale grey form of *Smerinthus ocellatus* bred by him in 1902, and several *Nisoniades tages* var. *taras*.—HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—February 2nd, 1909.—Mr. H. M. Edelsten exhibited a series of *Cænobia rufa* from various localities, including vars. *lineola*, *pallescentis*, and *fusca*, and photographs (by Mr. Main) of anal processes in female used to deposit the ova in the central pith of rushes.—Mr. W. J. Kaye, *Noctua glareosa* taken at sugar in Richmond Park, in Sept. 1907, also specimens from Sandown, Aberdeen, and Shetlands; those from the latter locality were very dark, save for one example intermediate between dark and light forms.—Mr. H. Leach, *Phlogophora meticulosa* taken at Rickmansworth, freshly emerged on Dec. 11th.—Mr. L. A. E. Sabine, *Dianthæcia conspersa* bred from Bude larvæ.—Mr. A. J. Willsdon, three broods of *Tephrosia biundularia* reared in 1906. Three pupæ of the third brood went over to 1907, and the resulting imagines differed in appearance from the bulk of the brood, having the lines on wings more continuous and more clearly defined, being, in fact, more like the first (spring) brood.—S. J. BELL, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, Feb. 15th, 1909.—Mr. C. E. Stott, Vice-President, in the chair.—Mr. Charles E. Raven, Mr. Albert Harrison, F.C.S., F.E.S., and Mr. Hugh Main, B.Sc., F.E.S., were elected members of the Society.—Mr. George Arnold, F.E.S., gave a lecture entitled "Hymenoptera." After outlining the classification of the order Mr. Arnold passed to the Aculeates proper, the group Vespoidea, Konow, and gave instances from the life-histories of *Chrysis ignita*, *C. osmiae*, and *C. viridula*. The lecturer then dealt with the ants, emphasizing the following points:—(1.) Division of labour, e.g. *Aphaenogaster*, soldiers, workers-major, workers-minor, &c. (2.) Slave-making (dulosis) and probable origin of same, e.g. *Formica sanguinea*, *Polyergus rufescens*, and *Anergates atrabulus*. (3.) Parthenogenesis, the cytological explanation of the process. (4.) Myrmecophilous animals, e.g. Aphids. The following genera of the Fossores were described and the chief features in the life-cycle noted, viz. *Ammophila*, *Sphex*, *Ampulex*, *Bembex*, *Philanthus*, and *Crabro*. In the Diploptera, wasps, the life-history of *Odynerus*, and the peculiar tube-building to the entrance of the burrows in *O. spinipes*, were very fully discussed. The lecturer concluded with a review of the Anthophila, with remarks on the parasitic Anthophila, such as *Sphecodes*, *Nomada*, *Stelis*, and *Psithyrus*. Mr. Arnold exhibited a small collection of types to illustrate his lecture. A discussion ensued, in which nearly all the members present took part.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*



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W. J. Lucas photo. & del.

West, Newman proc.

RAPHIDIA MACULICOLLIS.

1. Pupa ($\times 10$).
2. Imago, ♀ (nat. size).
3. Imago ♀ of *R. notata*, for comparison (nat. size).
4. Mandibles, &c., of Pupa (\times about 16).
5. Tip of right fore wing (magnified).

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RAPHIDIA MACULICOLLIS.

By W. J. LUCAS, B.A., F.E.S.

(PLATE IV.)

ON April 9th last Mr. G. T. Lyle and myself found near Rinefield in the New Forest a living pupa evidently belonging to one of the species of *Raphidia* (Snakefly). It was discovered in a piece of a branch about three inches in diameter lying on the ground, and in a decaying condition though not in an advanced state of decay. The very lively pupa had its limbs and other appendages free, and nothing could be seen in the nature of a cocoon. It was about one centimeter in length and the wing-cases were about three millimeters long. In colour it was generally pale yellowish, except that the abdomen was covered dorsally with large brown spots symmetrically arranged, that the eyes were very dark, and that the jaws were brownish.

By April 25th the pupa had become much darker than it was when found, at any rate on the dorsal aspect and especially anteriorly. It was kept in a small glass-topped box amongst loose bits of decaying wood, and was taken to Kingston when I returned on April 27th. Resting as it did on its side, in the semicircular position depicted on Fig. 1, it looked a peculiarly helpless object. In the evening of April 29th I found it had crawled up the side of the box and so was using its legs in the manner customary with insects, and therefore presented the dorsal aspect upwards.

By the morning of April 30th the imago had appeared and the pupal skin remained attached to the side of the box. It had probably but lately emerged as it seemed to be rather teneral and its colour became darker during the day. Towards evening it was noticed to be running about the box in a very lively way. A gnat (apparently *Chironomus dorsalis*) was introduced into the box, but the snakefly appeared to be afraid of it, though the gnat was at length seized and the *Raphidia* appeared to be eating it. The gnat was, however, soon set free, and was only partly

crippled. If the fact that the pupa when found was much lighter than it afterwards became shews that it had but lately changed from the larval state, then the pupal condition would seem to last about three weeks. Possibly, however, premature exposure may have caused the darkening.

Soon the snakefly was killed, as otherwise it is difficult to identify the species. It was then found to be a male of *Raphidia maculicollis*. Of the genus *Raphidia* there are four British species, *R. notata* (Fig. 3) being considerably larger than the other three—*R. maculicollis* (Fig. 2), *R. xanthostigma* and *R. cognata*—which are of about the same size. They belong to the natural order Neuroptera, in its restricted as well as in its wider sense.

In the Oxshott and Esher Common districts of Surrey this species appears to be fairly plentiful. I have met with it there as early as May 18th in 1901, whilst the latest date I have is June 14th in 1906. In the Wisley district I met with one on May 23rd, 1899. Mr. E. C. Goulton gave me a female taken near Lyndhurst in the New Forest in 1906, and Mr. D. Sharp gave me a Scotch specimen which he took at Nethy Bridge in July, 1908. Mr. M'Lachlan had received a specimen from Haslemere and another from Morayshire. So the species seems to be rather widely distributed. On May 20th, 1903, Mr. G. T. Porritt and myself took, chiefly by beating, about twenty-eight individuals in some two hours at the Black Pond, Esher Common. Most, if not all, had lately emerged, and had glossy wings shewing their teneral condition. One was found on a tree-trunk near its empty pupa-skin, which I then met with for the first time. The wings of the recently disclosed imago were yellowish and clouded, like those of a freshly emerged dragonfly; the joints of the body were pale brown, the rest of the insect being dark. One of the snakeflies taken that day and placed in a box with some *Hemerobius humuli* (judging by the results found afterwards) attacked two of the latter, killing them, and eating part of their body.

In *R. maculicollis* the wing-veining near the pterostigma seems sufficiently constant for purposes of identification. Attention should be paid to those cells containing a cross (Fig. 5). The single cell attached to the distal extremity of the pterostigma seems to be constant in this one of the four British species and peculiar to it.

It should be noted that the pupa is able to work its jaws, though it has no cocoon to cut open.

EXPLANATION OF PLATE.

1. Pupa of *R. maculicollis* in resting position on its side ($\times 10$). 2. Imago (female) of *R. maculicollis* (nat. size). 3. Imago (female), for comparison, of *R. notata* (nat. size). 4. Jaws of pupa of *R. maculicollis* ($\times 16$), for comparison with those of ant-lions and Chrysopas, belonging to the same natural order. 5. Tip of right fore wing of *R. maculicollis* (magnified).

ON THE ICHNEUMONIDÆ OF THE BANKSIAN COLLECTION IN THE BRITISH MUSEUM.

BY CLAUDE MORLEY; F.Z.S., F.E.S., &c.

FABRICIUS's connection with Sir Joseph Banks is obscure, but it is probable they became acquainted at the time that the former was working upon insects at the British Museum. This was previous to 1775, for many Banksian specimens were brought forward by him, including all the Australian ones, in 'Systema Entomologiæ' of that date. In these notes, however, I have had before me his 'Species Insectorum,' published at Hamburg and Kiel in 1781, and the numbers preceding each species refer to that work (pp. 420-442), since all were not enumerated at the earlier date, and such as were there instanced are again referred to at the later.

Besides these, the collection contains only the types of the three species given by Nils S. Swederus in his paper "Fortsättning af Beskrifningen på 50 nya Species af Insecter" (Sv. Ak. Handl. 1787, pp. 279-281).

The following list comprises all the specimens in the Banksian Collection in their order as placed, which has been preserved as at first received by the Museum authorities. The Collection was presented by the Linnean Society in 1863, and to those specimens especially referred to as typical, in the 'Museum Register of Zoological Accessions,' I have here suffixed an asterisk.† From the same source comes the information that "the following type specimens were not in the Collection when it was presented to the British Museum. . . . *Ichneumon melioratorius*, Otaheite; *Cryptus nutatorius*, New Holland; *C. fuscator*, Sandwich Isles; *Pimpla barbator*; and *Ophion luteus*, New Zealand."

It may be well to mention that the Antipodean insects were taken by Sir Joseph Banks while on his memorable voyage round the world with Captain Cook; most of them when the latter was stranded at Endeavour River, where Cooktown now stands, in 1770, and where he had to remain for repairs for four months. A copy of Cook's own sketch of the spot of beaching is in the library there.

MS. GENERIC LABEL:—ICHNEUMON.

1. *sugillatorius*.—2. *Cœlichneumon sugillatorius*, Linn. One female with immaculate post-petiole, and one male with neither head nor front legs.

† *Ichneumon oculator*, there indicated as such from "England," is not now represented in the collection, though said by Fabricius (Spp. Ins. No. 80) to have been in "Mus. Dom. Banks"; nor do I find the equally indigenous representatives of *Ophion latrator* and *O. saltator*.

12. molitorius.—1. *Protichneumon laminatorius*, Fab., ♂.
11. saturatorius.—2: (1) *Stenichneumon trilineatus*, Gmel., ♀.
(2) *Melanichneumon perscrutator*,
Wesm., ♀.
29. fossorius.—1. *Amblyteles subsericans*, Grav., ♀.
37. comitator.—2: (1) *Cœlichneumon comitator*, Linn., ♀.
(2) *Stenichneumon culpator*, Schr., ♂.
- [“negatorius, Sw. MSS.”—1. *Cratichneumon fabricator*,
Fab., ♂.]
2. raptorius.—1. *Amblyteles neglectorius*, Fab., ♀.
3. sarcitorius.—2: (1) ? *Amblyteles cerinthius*, Grav., ♀.
(2) *Ichneumon extensorius*, Linn., ♀.
7. nutatorius.—1. A representative of the Mesostenini, ♀.
This exactly corresponds with Frederick Smith’s description and
figure of *Mesostenus albopictus* (Trans. Ent. Soc. 1876, p. 477,
pl. iv. fig. 1) from New Zealand, and later recorded thence by
Cameron; the latter specimen, though not Smith’s type, is in
the British Museum. The only distinction—a very strong one—
is in the terebral length, which is not less than that of the abdo-
men. I consider it probable that *M. albopictus*, Smith (Proc.
Linn. Soc. iii. (1859), p. 172), from Key, is distinct. I cannot
find Fabricius’s species in either the British Museum Collection
or in Mr. Roland Turner’s extensive collection of Hymenoptera,
in which are some twenty distinct species of *Mesostenus* (*sensu*
lato) from Northern Queensland. Not a *Cryptus*, as placed by
Dalla Torre.
9. infractorius.—1. *Amblyteles infractorius*, Panz.
10. ambulatorius.*—1. *Amblyteles vadatorius*, Illig., ♀.
27. fusorius, var. β pisorius.—1. *Protichneumon erythrogaster*,
Steph., ♀.
15. luctatorius.*—1 (only). *Ichneumon extensorius*, Linn., ♀.
16. lotatorius.*—1. A typical-looking black female *Ichneumon*
(*sensu* Thoms., though it has more the facies and obtuse anus of
Amblyteles); respecting colour, it is only necessary to add that
the “thorace maculato” consists of a single callosity beneath
the radices, that the apical angles of the third abdominal seg-
ment are also red, with the whole legs, except coxæ, trochanters,
and extreme apices of hind femora, concolorous. It is a stout
insect of 12 mm. in length. Undoubtedly Fitch is correct
(Proc. Ent. Soc. 1883, p. xxxvi.) in synonymising *Priocnemis*
pascoei, Kirby (Trans. Ent. Soc. 1883, p. 200, not p. 20, as given
in ‘Zoological Record’ et D. T.), with this species. I, like him,
have compared the types, and find the variability he refers to
mainly in the immaculate scutellum and radical callosities of
I. pascoei, which also has the flagellum pale beneath; but its
sculpture throughout is entirely identical. The seven other
specimens referred to by him include a couple of the under-
mentioned male, which differs little, except in also having the

third abdominal segment pale. All are from New Zealand. *Colobacis forticornis*, Cam. (Trans. New Zealand Institute, 1901, xxxiii. p. 110) is entirely synonymous with the above, and is erroneously placed by its author in the Amblypygini on the shape—not structure—of the abdomen. *Colobacis* cannot be differentiated from *Ichneumon*, Thoms.

["Tinctorius, Sw. MSS."—A large *Ichneumon* (s. s.) or *Amblyteles*, with the abdomen coated with ?dirt.]

19. *vaginatorius*.—1. *Banchus* sp., ♀ (probably *B. pictus*, Fab., with the scutellar spine mutilated). "Scutello albo" = apical half only; "thorace maculato" = two round dots on metanotum and the same on front of mesonotum, and linear callosities beneath radices; third abdominal fascia is not "interrupta."

21. *bidentorius*.—1. *Amblyteles armatorius*, Forst., ♂.

20. *annulatorius*.*—1. *Amblyteles palliatorius*, Grav., ♂. I am not quite sure of this determination, since the head and front legs are missing, and the four first segments are alone basally black, but I have no doubt respecting the genus (cf. Ichn. Brit. iii. 45).

["Punctatorius, Sw. MSS."—*Amblyteles oratorius*, Fab., ♂.]

32. *sollicitorius*.*—This male ichneumon is not, as I had at first sight expected, the male of *I. lotatorius* (ante, No. 16), but of the somewhat closely allied *I. invectus*, Smith (Trans. Ent. Soc. 1876, p. 475), as the sculpture of the metanotum at once proclaims. Consequently both Fabrician titles stand, with, as its author originally suspected, and I have little doubt is the case, *I. insidiator*, Smith (*l. c.* p. 476, nec Tischb.) as male of *I. lotatorius*. There is a small series of both sexes in the General Collection in British Museum. Hutton (Cat. New Zeal. Dipt. 1881, p. 120) is the only author who has mentioned *I. sollicitorius* since 1824.

["Ferrugator, Act. Holm. 1787, p. 280."—Two females, marked with a type-label, as though they had passed from Swederus, who first described the species (*loc. cit.* viii. pl. iv. fig. 2), through the hands of Fabricius to the Banksian cabinet. Both sexes of this species, which I am inclined to regard as a *Melanichneumon* on account of its hexagonal areola, were re-described by Cresson (Trans. Amer. Ent. Soc. 1877, p. 208). It is entirely distinct from *Ichneumon ferrugator*, Kirby, Fauna Bor.-Amer. iv. (1837), p. 258, the type of which does not appear to be in the British Museum.†]

† I am not aware that *Cryptocentrum lineolatum*, Kirby, has been mentioned in literature since the erection of both genus and species in the above work in 1837 (pl. vi. fig. 1). I have discovered the type of this species in the General Collection of the British Museum, where are three others of which two are labelled "Georgia," and the third, received in 1844, from Albany River, Hudson's Bay, bears the MS. name "*Pimpla Annulata*." That they are typical representatives of the genus *Rhyssa* there can be no

61. rutilator.—1. A female *Cryptus* (*sensu* Thoms.), and probably nothing but *C. obscurus*, Grav. At all events, it has nothing whatever in common with *Tryphon rutilator*, L.

38. vigilator.*—1. It superficially resembles and is possibly congeneric with *Automalus alboguttatus*, Grav., though very distinct in many particulars; it is not, as I at first anticipated, *Catadelphus nigrocyaneus*, Tosquinet, Ichn. d'Afrique (Mém. Soc. Belg. 1896, p. 103). "*Africa æquinoctiali*" probably refers to the Gold Coast.

68. elongator.*—Two males, *Alomyia debellator*, Fab.

73. lineator.—1. *Cælichneumon lineator*, Fab., ♂.

["an Ichn. Luctatorius, Fab., Sp. No. 15."—This would appear to represent the "*Zelandicus puncto albo sub alis, vix tamen distinctus*," but I suspect some error here, for the single specimen under this label is a typical female of *Trogus exaltatorius*, Panz. In any case, it is extremely improbable that any Ichneumonid (s.s.) has its "*Habitat in Europa, in noua Zelandia*"; though at least one Tryphonid—*Bassus lætatorius*—is known to do so.]

67. delusor.—2: (1) *Lissonota ? vicina*, Holmgr., ♀.

(2) *Phygadeuon* (s.s.) sp., ♀.

26. lætatorius.—2. Both *Bassus lætatorius*, Fab., ♀ ♀.

["*Novatorius*, Sw. MSS."—This specimen is an *Ichneumon* (*sensu* Thoms.).]

35. reluctator.—1. *Cælichneumon lineator*, Fab., var. *fercus*, Gr., form *rufescens*, Berth., ♀.

41. debellator.—1. *Alomyia debellator*, Fab., ♀.

[*Cælichneumon cyaniventris*, Wesm., ♂, placed after No. 41, is very roughly labelled "*vix a sugillatorio distinctus*."]

MS. GENERIC LABEL:—CRYPTUS.

25. dubitorius.*—A large female Braconid: "*Habitat in noua Hollandia*."

34. decoratorius.*—This is not a *Cryptus*, as placed by Stutton (Cat. New Zeal. Dipt. 1881, p. 123) and Fabricius in 1804, for the type is a female, and has no mesopleural sulci. It is certainly referable to the genus *Platylabus*, and is allied in coloration to *P. rufus*, Wesm. The only, and entirely, black fourth segment recalls the similar band of *Pezomachus fasciatus*, Fab. "*Ultimo segmento fascia atra*" is a very loose phrase.

40. caudator.*—A female *Lissonota* (or possibly *Syzeuctus*,

doubt, though the areolet—as described by Kirby—is entirely wanting in one specimen. I have seen thence no female, to which sex the original specimen was erroneously referred, but have little hesitation in entirely synonymising it with *R. persuasoria*, Linn., which is hardly of rarer occurrence in America than in Europe.

for I cannot see the spiracles), with the terebra longer than the abdomen. "Habitat in noua Hollandia."

44. profligator.—2. Both females of *Glyphicnemis profligator*, Fab., as set forth in my Ichn. Brit. ii. 63–66; both have the frons distinctly and not confluent punctate, the antennæ centrally clear white, and the size not large. They are in capital preservation.

75. maculator. — 1. A large male *Pimpla (Itopectis) scanica*, Grav., which has recently been synonymised with *Ichneumon maculator* (cf. Ichn. Brit. iii. 103). Curiously enough, it is of the (? more usually Oriental) form, not uncommon in India, having the hind tibiæ with no black markings.

128. Acarorum.—1. *Myrmosa melanocephala*, Fab. E. S. 1793. "Habitat in Europæ borealis Curculionum laruis"!

MS. GENERIC LABEL :—BASSUS.

82. prærogator.—2: (1) A Tryphonid, but not *Tryphon (Dyspetes) prærogator*, Grav.; the areolet is entirely wanting.

(2) A black *Limnerium*.

["Ichn. Agrestorius, Gmelin, p. 2679, n. 341."—1. ♀: "Habitat in Insula Otaheiti. Mus. Dom. Banks." This is the type of Swederus's species (Sv. Ak. Handl. 1787, p. 279); it has not been mentioned in literature since 1790, and is allowed to remain in its original genus by Dalla Torre in 1902. In the Banksian Collection it is placed in *Bassus* (as understood by Fabricius, nec Fallén); but the type differs from Holmgren's Pimplid genus *Echthromorpha* solely in lacking the apical alar infumescence. It is congeneric with both *Pimpla variegata*, Brullé, and *Chrysopimpla ornaticipes*, Cam. An analogous specimen was captured by Dr. Coppinger in the same island during "The Voyage of H.M.S. Alert" in August, 1880.]

36. objugator.*—1. "Habitat in Africa æquinoctiali." This female is quite certainly synonymous with *Osprynchotus heros*, Schlett. (Ann. Soc. Belg. 1891, p. 33), as set forth by Tosquinet (Ichn. d'Afrique, 248). It is recorded from Togoland, the Cameroons, Senegal, Sierra Leone, and the Congo; from the last locality Miss E. M. Sharpe presented five Hymenoptera to the British Museum in 1890, of which one female belongs to the present species, thus fixing its locality.

MS. GENERIC LABEL :—PIMPLA.

62. manifestator.—2. Both are *Ephialtes mesocentrus*, Grav., females; the second has lost its head. Stigma fulvous; hind tibiæ not shorter than their tarsi.

66. irritator.—1. This North American female was correctly relegated in 1846 to the genus *Ephialtes* by Brullé, whose short

description (Hist. Ins. Hym. iv. 81) is accurate as far as it goes. The economy of this species is outlined by F. H. Chittenden ('Insect Life,' v. (1893), p. 247; cf. iii. p. 461). It is said to be ectoparasitic upon larvæ of the Longicorn beetle, *Leiopus variegatus*, Hald. No male has yet been assigned to it; the female, as is usual in the genus, is probably much the commoner sex.

104. *punctatus*.*—1 ♂; "Habitat in Coromandel." This is quite certainly the *Pimpla ceylonica* of Peter Cameron (Manch. Mém. 1899, p. 165), for I have compared the types *inter se* and find them to agree *ad amussim*. The latter author is incorrect in supposing Krieger's description of *Xanthopimpla punctata* (Ber. Nat. Ges. Leipzig, 1899, p. 101) to appertain to a distinct species. The fault lies entirely in the Fabrician diagnosis.

74. *extensor*.—1. *Glypta sculpturata*, Grav., ♀. Fabricius refers the species to Linnæus and Geoffroy, but it is impossible to read any meaning into the old descriptions, such as Fourcroy (Ent. Paris. 1785, p. 423), Schrank (Fauna Boica, 1802, p. 270), Walckenaer (Fauna Paris. 1802, p. 60), or Latreille (Hist. Crust. et Ins. 1805, p. 180; cf. Grav. Ichn. Europ. 1829, iii. pp. 980-1). And the name has hitherto been, and still should continue to be, applied to *Ephialtes extensor*, Tasch. (Zeits. Ges. Nat. 1863, p. 255), which I have recently been enabled to add to the British fauna through the kindness of E. A. Cockayne, Esq., who took it in Kensington Gardens in 1908 (cf. also Marsham, Trans. Linn. Soc. 1797, p. 23).

77. *strobilellæ* (labelled "Ichn. strobionellæ? Fabr. Sp. Ins. No. 77").—This is a typical *Lissonota cylindrator*, Vill., ♀; by no means representing its description, which is simply copied from Linnæus (Syst. Nat. ii. p. 935). "Habitat in Larva Phalænæ Strobilellæ & Turionellæ."

[“Ichn. Fuscator, Sw. MSS. Ex Ins. Sandwich.”—An entirely black, red-legged *Ephialtes*, differing in no appreciable way from *E. extensor*, Tasch. I suspect some unfortunate transposition has here taken place, for Fabricius describes this species in his 'Piezota' of 1804, p. 85, under the name *Cryptus fuscator*, as having only the front pair of legs red, with a black mark before the apices of the wings, both of which points diverge from this specimen.]

65. *compunctor*.—1. A large female *Pimpla* (*Apechtis*) *brassicariæ*, Poda.

MS. GENERIC LABEL:—OPHION.

96. *luteus*.—2 ♀ ♀: (1) *Ophion luteus*, Linn.

(2) *Paniscus? testaceus*, Grav.

100. *Morio*.*—1 ♀. "Habitat in America boreali." This is a rather broken specimen, and was correctly placed in his genus *Thyreodon* by Brullé in 1846. It is quite common throughout Northern and Central America; specimens in British Museum

are from Massachusetts, New York, New Hampshire; Orisaba, Jalapa, and elsewhere in Mexico. Strangely enough, it is not included in 'Biologia Centrali-Americana,' i. (1883-1900), p. 288, although in the representative collection of that work are two females bearing (Mr. Champion tells me certainly) the MS. label, "*peronatus*, Cameron," who perhaps had some doubt respecting its priority! This label I have destroyed.

101. *amictus*.* — A single headless female of *Schizoloma amicta*, Fab.

102. *glaucopterus*. — A fine female *Opheltes glaucopterus*, Linn.

88. *falcator*. — This is certainly the same species as "*Banchus falcator*," Piez. 128, and not distinct, as given by Dalla Torre (Cat. iii. 64 et 142). It is neither a *Banchus* nor *Campoplex*, as its entire lack of areolet at once testifies. My knowledge of the Ophioninæ is not sufficient to enable me to name the single female in the collection, and I can but superficially describe it as a medium-sized *Anomalon* with the hind tarsi not spatuliform; the abdomen, with the exception of the second segment discally, is centrally red, and both thorax and scutellum are entirely black. It cannot, I think, be the *I. falcator* of Ent. Syst.

MS. GENERIC LABEL:—BRACON.

47, *Ichn. fastidiator**; 49, *I. proficiscator**; 50, *I. hospitator*; 51, *I. denunciator**; 53, *I. defensor**; 56, *I. capitator**; 46, *I. desertor*; 55, *I. insidiator**; 57, *I. mutator**; and "*Ichn. Assimilator*, Nov. Act. Holm. 1787, p. 280," of Swederus; are all Bracônids, and do not fall within the scope of this paper.

ACROLITA CONSEQUANA, H.-S., IN DEVON, WITH STRAY NOTES ON ITS HABITS, &c.

By EUSTACE R. BANKES, M.A., F.E.S., &c.

WITH reference to Mr. C. Granville Clutterbuck's note (*antea*, p. 100) chronicling the discovery in South Devon, in July, 1907, of larvæ of *Acrolita consequana*, from which seven imagines were bred in the following month, it may be of interest to record the fact that I took this species in South Devon as long ago as August 13th, 1900. The moth being abundant throughout my visit, which terminated early in September, a nice series was secured, and either it or the larva has proved equally common in the other years in which the same locality has been explored. I also bred it in plenty, July 1st—August 27th, 1902, from larvæ of all sizes collected there in the latter half of September, 1901, and have distributed some of these Devonshire specimens, with full data, among various friends.

The species has been recorded as double-brooded in Hants (Vict. Hist. Hamps. 147) as well as in Dorset (Prac. Hints, ii. 84), with reference to which counties Meyrick (H. B. Brit. Lep. 505) enters the first brood as appearing in May, and the second in July and August. The moths reared by Mr. Clutterbuck from South Devon on August 6th obviously belonged to at least a second brood, since the larvæ that produced them were found feeding in July, and the fact that my imagines of the first brood, bred from the same coast, only emerged in July and August was doubtless due to the larvæ and pupæ being kept in a very cool place. I have taken the perfect insect on many dates in September, and having then noted it as common at the same time that larvæ of all sizes were abundant, think it not unlikely that there is, throughout the summer and early autumn, a constant succession of broods, with much overlapping, and no marked intervals between them. In any case, the probability of the occurrence of, at any rate, a third brood in South Devon is suggested by my having met with the imago in some numbers, and in fine condition, on September 24th—26th, and having captured in sugar, in 1906, a good example of the female as late as October 15th.

The moth has frequently shown itself to be possessed of "a sweet tooth" by visiting this bait at some distance from its haunts, generally only in odd individuals, but more or less commonly at times. When the weather conditions are favourable it flies freely during the evening—not only "at dusk," as stated by Wilkinson (Brit. Tort. 187 (1859))—but is very difficult to net, its protective colour and rapid dashing flight preventing the eye from following it against the background of sand and shingle in which its food-plant grows.

In my experience, the larva, when feeding in the autumn, gradually constructs, as a rule, a well protected gallery, of remarkable length, up the exterior of the stem of the shoot, by joining together with silk the leaves that grow thereon and drawing them in towards the stem; it works its way upward by degrees, and, as it progresses, eats out the contents of the indrawn leaves, whose bleached appearance then attracts instant attention to the situation of the larval gallery. It has often been observed devouring the seeds, but I do not happen to have found it feeding in this manner. *A. consequana* hibernates as a full-fed larva, spun up in an opaque dirty-ochreous cocoon formed of tough silk, and normally pupates therein in the spring, though some of my larvæ cannot well have done so before July. In confinement, certain individuals spun their cocoons among the pieces of the plant, whilst others fixed them against the bottom or sides of the cotton bag in which they were imprisoned; they seemed particularly fond of attaching to the outside of the cocoon any minute pebbles that could be

found, and from this it is reasonable to assume that, in nature, the cocoons are spun amongst, and coated with, the coarse sand that surrounds the food-plant. This is *Euphorbia paralias* in South Devon, to which district my acquaintance with the insect is limited, and also in Hayling Island, as we learn from Wilkinson (*l. c.*), but in the Isle of Portland *E. portlandica* has been proven to be the chosen plant.

The examination of a large number of bred imagines shows that the females average somewhat smaller, and rather paler, than the males. My largest examples of the former expand 16 mm., while those of the latter measure 14 mm., and in smaller specimens there is about the same proportional difference in size between the sexes. The smallest individual known to me is one of my bred Devonshire males that has an expanse of only just 10 mm. From the numerous observations that I made with regard to the hour of emergence, one learns that seventy-two per cent. of the moths left the pupa between 6.30 a.m. and 1 p.m., the rest showing no special predilection for any one period of either day or night over another.

Norden, Corfe Castle: April 10th, 1909.

TORTRICES NEAR LIVERPOOL IN 1907-8.

By W. MANSBRIDGE, F.E.S.

ABOUT twenty species of the Tortricina, not met with in our localities by myself previously, have been captured or bred in the last two years.

Tortrix cratægana from Knowsley and Simonswood; the former being a yellow form. I also saw this moth in some numbers at Delamere Forest, but it was worn at the end of July when it was found. *T. unifasciana* is generally darker from the mosses than from Wallasey. An addition to the local lists is *T. cinnamomeana*. This moth was quite common in 1907 on Kirkby Moss, and last year a single specimen was netted in Delamere Forest. *T. corylana* seems generally distributed, but only odd specimens have fallen to my share at St. Helens, Simonswood, and Delamere Forest. I met with *T. viburnana* in some numbers at Whitegate Heath, males only, the first week in July. *T. forsterana*.—This is another moth that seems to be darker at Simonswood than at Wallasey or near Leeds. The beautiful and very common little moth *Peronea variegana* is everywhere found on the whitethorn hedges. The South Lancashire forms seem to be confined to vars. *borana*, *cirrana*, *asperana* and type, with var. *albana* rarely; some of the *cirrana* forms are a very lovely dark blackish purple. I have not taken the extreme form at Wallasey. In April, 1907, I found a pair of

hybernated *P. hastiana* in copula at Formby. This is mentioned because I believe the spring habits of this extremely abundant species are little understood. Personally I have never found it after hibernation except on this occasion. A nice series of *Teras contaminana* var. *dimidiana* was bred from larvæ found at Crosley when arranging for our summer field-meeting. Nearly all were extremely dark, though of this form. *Dictyoptyeryx forskaleana* has been found in some numbers at Wallasey by Mr. C. B. Williams among sycamore, and I took a specimen at Kirkby last August. When at Crosby last June, I found a number of larvæ on iris and ranunculus; these turned out to be *Tortrix costana*, a large and handsome species. *Penthina variegana* has shown up in odd specimens from various localities, and if worked for would be found commonly. *P. dimidiana* I have only found at Simonswood occasionally; in 1907 I bred two or three from larvæ beaten from birch the previous autumn. *Anti-thesia aceriana*, one specimen at Sefton Park in 1907. *Sericoris bifasciana*, also one specimen from Delamere, July, 1908. *Cnephasia musculana*, one from Delamere, May, 1907. *Sciaphila pascuana*, although not noted previous to 1907, has since occurred at Delamere and Simonswood, not uncommonly. *Clepsis rusticana* was new to my collection when I captured a few specimens at Kirkby Moss in pine or among sweet gale. In a clump of rushes, only about a square yard altogether, on Kirkby Moss, *Bactra lanceolana* was quite common in August, 1908, and a few rather dark specimens were taken at Hatchmere last July, where it is no doubt common. A specimen of *Phoxopteryx lundana* came to light at Sefton Park in August 1907, and *P. mitterpacheriana* occurred at Delamere, in May, 1907. The imago was found sitting on birch leaves.

When looking for *C. flavicornis* at Simonswood in April, 1907, and also at Delamere the same year, I gathered all the distorted catkins from the birches that I could find; later these produced a fine series of *Graphiolitha ramella* type and var. *costana* in about equal proportions, though perhaps in the Delamere series the type slightly outnumbered the variety. A nice series of *G. nevana* was bred from holly tips collected near Liverpool in 1908, and a few *G. geminana* from *Vaccinium* found at Delamere; on the same ground in July this species was abundant, flying freely when disturbed in the daytime.

Among the pines at Simonswood in 1907 I found a moth that at first seemed familiar, but at the time I could not recognize it; on comparison at home, however, it turned out to be a very dusky form of the male of *Batodes angustiorana*; it was so dark as to suggest the possibility of a black form parallel to the var. *fuscana* of *T. podana*. The locality is likely, and a black form is one that might reasonably be expected to occur, hence I shall look out for it every season if I can get there at the proper

time. *Pædisca bilunaria* occurs at Kirkby Moss in fair numbers; the series taken last year is considerably darker than my southern set from Wimbledon Common. *P. solandriana*, always abundant among birch, occurred in its usual numbers. I generally get the scarcer forms best by breeding from Delamere larvæ. *Heusimene fimbriana* was a very pleasing capture in April, 1907, when I got a single specimen at Delamere; subsequent search for it at the same place has been unsuccessful. At the same time and locality *Coccyx argyrana* was abundant on the oaks.

Perhaps the red-letter record among the Tortrices for 1908 was the capture of a beautiful specimen of *Stigmonota pygmæana*; it was beaten from spruce fir in Delamere Forest, one very cold day in April.

At Wallasey, in July, *Dicrorampha petiverella* was common, and a few *D. politana* also occurred, both flying swiftly in the hot sunshine. At the same time I was pleased to find that the efforts of the golfers have not quite exterminated the very local *Rhodaria sanguinalis*, very close work producing three fair examples. *D. saturnana* is represented by one specimen from a garden wall near Sefton Park, Liverpool; probably some tansy was growing in the garden on the other side. *Eupæcilia nana* occurred at Knowsley and at Simonswood Moss in fair numbers; *E. maculosana*, one specimen, at Knowsley in 1907. A second brood of *E. dubitana* was noted at Crosby sandhills in September, 1907, and at the same time *Catoptria expallidana*, which must have been a second brood, was abundant.

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ON THE NEUROPTEROUS GENUS *RAPHIDIA*, LINN.

BY CLAUDE MORLEY, F.E.S., F.Z.S.

ONE so rarely meets with mention of this genus in periodical literature, and Mr. Lucas tells me that so little is known respecting it that it may not be out of place to offer a few remarks from my own experience, very scanty though it be. These insects are remarkable for the peculiar elongation of the prothorax into a snake-like neck bearing a narrow and vicious-looking head, and when handled they pose the latter in a terrific ophidian manner, as was noted by Kirby and Spence (Introd. 7th ed. 6), while De Geer says they then eject a drop of brown and fetid liquid from their "proboscis" (Mém. ii. 734), though his allusion is more probably to the allied genus *Panorpa*. The genus consists of very few species, all of which are confined to the Palæarctic region; in Britain we have but four, which

may still be differentiated by the characters given by Dr. Hagen (Ent. Ann. 1858, p. 30), though his *R. londinensis*, Steph. is now considered a mere variety of *R. xanthostigma*, whose subradial nervures are often irregular; in fact, I possess a specimen exhibiting the characters of both forms in its alternate wings.

R. xanthostigma, Schum.—I have captured but four examples of this species, which I consider distinctly rare. Two females are from a dry and sandy part of Brandon in Suffolk, and were taken on 10th and 11th June, 1899; the one beaten from the branch of a dead and large oak-tree, and the other found beneath dead and rotten oak-bark, along with such subcortical beetles as *Hypophlæus bicolor* and *Thanasimus formicarius*. The other pair, on the contrary, occurred in an extremely wet part of Tuddenham Fen, some twelve miles distant, on 6th June, 1903, when a male was beaten from a large live willow-tree, and 19th June, 1901, when I detected a female settled on the leaf of a well-grown water-dock; I remember that it took to flight as I approached it through the ooze.

R. cognata, Rbr.—This is evidently extremely rare. The only example of which I have heard was captured in Foxley Wood, Norfolk, in June, 1886, by my friend Mr. H. J. Thouless, and is in the collection of McLachlan, who had not seen a specimen less than sixty years old (cf. E.M.M. 1900, p. 263).

R. maculicollis, Steph.—Apparently confined to the New Forest, where it is by no means uncommon. I beat a female from hawthorn blossom at Brockenhurst, 26th May, 1895 (E.M.M. 1895, p. 193), and on the previous day took another with aberrant neurulation at Holmsley Marsh. In the middle of June, 1907, I found both sexes sparingly at Wilverley Inclosure, Matley Bog, and Denny Wood, though in nothing like the profusion stated at E.M.M. 1894, p. 189.

R. notata, Fab.—Our last indigenous species is the only one with any claims to frequency or general distribution; it probably occurs in all the ancient-timbered districts southerly from the Midlands. In the New Forest it has occurred to me on live oak-trees, sitting on bracken, and lying dead upon water at Brockenhurst, Lyndhurst and Wilverley, in May, 1895 and June, 1907. In Suffolk I have beaten the female from birch in Assington Thicks, on 21st May, 1899, and from bushes in the Bentley Woods on 15th June, 1895. But though I constantly worked the latter locality from 1893 to 1904, I saw no more imagines. On 20th July, 1900, the head, &c., of a larva were detected beneath the bark of comparatively new pine railings there.

Concerning the life-history of this species, Mr. G. T. Lyle has recently (Entom. 1908, p. 233) described the eggs from the New Forest; they are probably laid in the crevices of bark. Respecting the larva, I quote from my diary of 5th November,

1900: "Found a larva of *Raphidia* sp. in burrows in holly, a solid old stem with the bark not very firmly affixed. This larva was quite healthy and lively on 5th March, 1901. It had just become a nymph in no enveloping case on 20th April, 1901. It appeared to attain greater degrees of activity the nearer it approached maturity. On May 4th it was able to hold on to a piece of wood with its pupal legs, move its abdomen and head freely in a vertical direction. On May 6th a female *R. notata* emerged; it had just evacuated its nymph skin at 10 a.m. and the wings were already of normal length, but the wings, legs, ovipositor, antennæ, clypeus, and cibaria were quite pellucid-white, the abdomen and thorax were red, the head and two apical tarsal joints being the only black parts. The insect took till 4 p.m. to attain perfection, and did not move a fraction of an inch the whole time; the day was normally warm, damp and dull. The nymph itself had crawled to a horizontal position in its box, where, however, it was not very firmly attached, as on the box being jarred it fell to the bottom. The larva had gnawed a narrow and shallow ridge in the very hard holly-wood enclosed with it during the winter."

Waterhouse says (Trans. Ent. Soc. i.) that the larva of this genus lives *in* the bark, and Westwood suggests that this was because they were preparing a retreat for their pupation, believing them from the oral structure to be predacious. McLachlan says (E.M.M. 1894, p. 186) that they are found *in* dead wood and *under* bark; he kept one larva: "it is fed occasionally with a fly, and seems to thrive; I suspect it feeds at night, for I have never been able to detect it in the act"; nor does he say that the flies were actually devoured. At all events my larva had nothing but a ligneous diet from November to May!

A further examination of the larva-skin reveals that the nymph probably emerged from the castaneous, hard and chitinous prothorax, which is split longitudinally throughout its disc, as also is the basal portion of the similarly conformed head as far as the region occupied in the imago by the ocelli; the dull white larval abdomen appears to have been shuffled off and in no way fractured; it is now strongly curled ventrally. Its mandibles have the apex much more elongate and acuminate than is figured by Westwood (Mod. Class. ii. 56, Fig. lxvi. 9), with the inner basal tooth much more prominent and sub-rectangular. The cast nymph-skin, carded when soft, is transparent, flavescent, and 12 mm. in length; all the members, including the antennæ and remarkably short recurved terebra, are perfectly free, and the hind legs are in no way impeded by the wings, which in the nymph measure 5 mm., and in the imago, which emerged from it, 13 mm. in length.

A NEW BEE OF THE GENUS *MEGACHILE* FROM AFRICA.

By T. D. A. COCKERELL.

Megachile ekuivella, n. sp.

♀. Length about 9 mm.; black, with a short broad heart-shaped abdomen; face broad, eyes prominent, converging below; sides of face, cheeks, and base of mandibles with copious snow-white hair (that on face varying in some specimens to yellowish); vertex with fuscous hair; mandibles with three evident teeth, but the fourth or inner one obsolete; clypeus densely punctured, but with a median rather elevated smooth shining band; front very densely rugoso-punctate; antennæ black; mesothorax and scutellum as densely punctured as is possible, dullish, with short hair, mixed dark fuscous and pale ochreous, the latter predominating; sides and under part of thorax, and femora, with white hair; hair on inner side of tarsi orange; hind basitarsus broadened and flattened; claws with a basal tooth; tegulæ dark fuscous in the middle, hyaline and reddish on the margin; wings dusky, nervures black; abdomen with entire orange-fulvous hair bands on the apical margins of the segments; last dorsal segment with black bristles; ventral scopa bright orange-fulvous, white basally, black on last segment.

With the females comes a male, assumed to be conspecific:—

♂. Hair of head and thorax above mixed black and white, not ochreous; hair-bands of abdomen white, with coarse black hair on the discs between them; antennæ slender, black; wings strongly dusky; anterior tarsi simple; anterior coxæ without spines; claws cleft, the inner tooth the smaller; carina of sixth abdominal segment jagged, with little truncate spines or teeth, three or four on each side, the median interval rounded, but not especially large; no subapical spines or teeth beneath.

Hab. Hinterland of Benguella, January 3rd, 1908, female type (Wellman); Ekuiva Valley, five females, one male; two of the females at flowers of *Compositæ* (Wellman).

This little species is related to *M. caricina*, Ckll., but is smaller, and easily distinguished in the female by the mainly pale ochreous hair of the scutellum (that of *caricina* being coarse and black) and the orange-fulvous abdominal hair-bands. The male differs conspicuously in the jagged carina of sixth abdominal segment. *M. venusta*, Smith, judging by the description, seems to have many points of resemblance, but the abdominal bands are white in *venusta*, and the scopa is not black apically. Even closer resemblance may be found in *M. cordata*, Smith, from Natal, but Smith makes no mention of any black or fuscous hair on the dorsal surface.

NOTE ON *EVETRIA (RETINIA) BUOLIANA*, SCHIFF.,
AND *E. PINICOLANA*, DBLD.

By EUSTACE R. BANKES, M.A., F.E.S., &c.

IN the Editorial review [Entom. xli. 255-256 (1908)] of Mr. A. J. Gillanders' 'Forest Entomology' we read, on p. 256, "The species represented on p. 269, fig. 256, is certainly *Retinia buoliana*, but moths bred from larvæ feeding in the leading shoots of Scots pine, as illustrated (fig. 255), are usually *R. pinicolana*" This latter assertion is perhaps true of certain districts, but it would be interesting to learn what evidence can be adduced in support of it as a general statement. At different times I have collected, in various localities in East Dorset and West Hants, large numbers of *Evetria* larvæ feeding in the leading shoots of Scots pine, precisely as shown in the illustration (fig. 255) in question, and have reared scores of imagines from them, every one of which, with the exception of a single *pinicolana* bred from among some Ringwood larvæ, has been referable to *buoliana*. Wherever plantations of Scots pine are found in this part of the country, *buoliana* seems to be either common or abundant, whereas *pinicolana* is so exceedingly local that a spot in the Isle of Purbeck, where I discovered it in 1901, is still its only known Dorset habitat except for one which has yielded a solitary individual. Moreover, even where the two species occur together, *buoliana* is, in my experience, *by far* the more plentiful, and this is the case in all districts about which I have definite information, though it will be sufficient to quote from only the three authors first to hand. In the course of his valuable notes on "The Tortrices of Surrey, Kent, and Sussex," the late Mr. Walter P. Weston wrote in Entom. xiii. 160 (1880), "*Retinia buoliana*, Schiff.—Common among various kinds of firs. . . . It occurs throughout these counties. *Retinia pinicolana*, Dbld.—Of similar habits to the preceding species, but much scarcer. . . . It has occurred at Tunbridge Wells, Dartford; Hastings, Uckfield, Tilgate Forest; Croydon, West Wickham." In the catalogue of Lepidoptera published in the 'Victoria History of Hampshire,' the notices of these species were from the pen of Mr. W. H. B. Fletcher, and run as follows: "*Retinia buoliana*. Abundant in plantations of young Scotch firs in New Forest. *Retinia pinicolana*. Less common by far than the preceding in New Forest." Again, Mr. A. Thurnall, in his "List of Tortrices taken in South Essex between 1885 and 1901," published in Entom. xxxv. (1902), sums up his experience as follows, on p. 191: "*Retinia buoliana*, Schiff.—Very common wherever *Pinus sylvestris* grows, . . . *R. pinicolana*, Doubl.—Much rarer than the last species; singly

in Wanstead Park, Warley, and Blackmore at rest on *P. sylvestris*."

Seeing that both species feed in exactly the same way, and that *E. buoliana*, as both Mr. Fletcher and I have learned to our disappointment, is certainly no less fond than its close ally of the leading shoots of the Scots pine, and is infinitely more numerous than it in each of the six English counties mentioned above, one is certainly justified in asking for some proof of the accuracy of the reviewer's statement.

Norden, Corfe Castle: April 14th, 1909.

DESCRIPTIONS OF TWO NEW SPECIES OF *MUTILLA* FROM KUCHING, BORNEO.

BY P. CAMERON.

Mutilla annexa, sp. nov.

Black, the basal two abdominal segments and the basal fourth of the third, red; the head and thorax densely covered with white pubescence, the metanotum being also covered with a white depressed pile; the base of abdomen sparsely covered with white hair; the apex of the second, third, and middle of fourth fringed with longish white hair; the sides of the third and the apices of the following segments thickly fringed with stiff black hair. Wings almost hyaline, the nervures black; the first abscissa of radius straight, obliquely sloped, about one-fourth longer than the second, which is a little shorter than the third; the first transverse cubital nervure rounded, oblique; the second broadly rounded outwardly; the first transverse cubital nervure is received very shortly before the middle of the cellule. Tegulae black on the inner side, the outer (and larger) part rufo-testaceous. Keel on basal ventral segment straight. Pygidium rather strongly and closely punctured. ♂. Length, 9 mm.

Kuching, Borneo (John Hewitt, B.A.).

Vertex on either side of the ocellar region finely, closely, obliquely striated; the ocellar region smooth, raised; bordered by a narrow furrow. Front sparsely punctured; a smooth, shallow furrow down the lower half. Antennal scape furrowed below, the sides of the furrow keeled. The basal two joints of the flagellum are not much longer than the third united. Occiput broadly rounded. Pro- and mesothorax strongly, but not very closely punctured; the scutellum is more coarsely rugosely punctured. Metanotum reticulated; the basal area has the apical half narrowed, about half the length of the basal part; the bordering keels are more or less curved.

Allied to *M. attila*, Cam.; the latter is a larger species, has the wings distinctly dark fuscous, the tegulae black, the basal abscissa of the radius is curved, not straight, the first recur-

rent nervure is received beyond the middle of the cellule, and the area on the base of metanotum is almost of equal width throughout.

Mutilla devia, sp. nov.

Black; the head, thorax (the pronotum and the mesopleuræ densely), the apices of the abdominal segments and the legs covered with longish white pubescence; the wings hyaline, the nervures black; the first abscissa of the radius straight, sharply oblique, about one-fourth shorter than the following two united, the second about one-fourth longer than the third; the first recurrent nervure is received in the middle of the cellule. Tegulæ dark testaceous at the base, the apex white; they are covered with white pubescence. Keel on basal ventral abdominal segment distinctly dilated at the apex. ♂. Length, 7 mm.

Kuching, Borneo (John Hewitt, B.A.).

Vertex on either side of the ocellar region finely, closely, longitudinally striated, sparsely covered with longish black hair; the front densely covered with silvery pubescence. Pronotum closely, the mesonotum less closely, but more strongly punctured; there are two distinct furrows near the centre of the apical half of the mesonotum. Scutellum more closely, rugosely punctured than the mesonotum. The space bordering the scutellums and the base of the metanotum densely covered with depressed silvery pubescence. There is no clearly defined area on the base of the metanotum unless it is hidden by the dense pubescence; the metanotum is rather coarsely reticulated. Calcaria white. Third antennal joint about one-quarter longer than the fourth.

THREE NEW ANTHOPHORID BEES FROM TEXAS.

By T. D. A. COCKERELL.

Tetralonia argyrophila, sp. nov.

♂. Length about $13\frac{1}{2}$ mm., black, with the hair on the head, thorax, and basal segment of abdomen (covering the latter densely) ochreous, rather bright on the thorax above. Clypeus bright lemon-yellow, the yellow angularly incised laterally; labrum cream-colour with a narrow black edge; mandibles without any yellow spot; antennæ very long, entirely black; third joint very short, its shorter (anterior side) about as long as its apical breadth antero-posteriorly; mesothorax dull, densely punctured; area of metathorax rugose; legs with pale hair, that on inner side of basitarsi light orange; middle tarsi not distorted; hind spur of hind tibiæ normal; abdomen beyond the first segment shining black with sparse black hair, but with scattered long silvery-white hairs, becoming numerous toward the apex, and forming a sort of thin fringe on the sides of segments four to six; apical margin of sixth and sides of seventh with short light hair. In my table in Trans. Amer. Ent. Soc. 1906, this runs to 4 on p. 79, and does not precisely fall in either category there indicated. On the whole

it runs nearest to *T. edwardsii* (Cresson), to which it has a very strong superficial resemblance, differing, however, by the black hair on the basal part of the second abdominal segment (although that segment has some light hair subapically), the brilliant silvery hairs on the apical part of the abdomen, and the shorter third antennal joint. The last two characters also separate it from *T. acerba* (Cresson). There is no light band on the fifth segment, such as is seen in *T. edwardsii vagabunda*, Ckll. In some respects *T. argyrophila* closely resembles *T. fedoris*, Ckll., from the same region, but the apical part of the abdomen is very different, and the wings have none of the dusky yellowish tint of *fedoris*.

Hab. Lee County, Texas, March 24th (Birkmann, No. 16).

Melissodes masuca, sp. nov.

♂. Length about $11\frac{1}{2}$ mm., black, with ochreous pubescence, becoming bright yellowish red on the thorax above. No black hair on head or thorax. Head rather broad; eyes dark reddish; clypeus (except the two black spots), labrum, and large spots on base of mandibles yellow; antennæ long, flagellum black above, clear ferruginous below; third joint broader than long; mesothorax with strong punctures; tegulæ clear ferruginous; wings dusky, nervures rather dilute brown; legs ordinary, apex of middle and most of hind tibiæ ferruginous; abdomen with continuous bands; hind margin of first segment rather narrowly whitish hyaline, of the others broadly and suffusedly dark reddish brown; segments two to five with broad basal bands of ochreous tomentum; second with also an entire straight median band; sixth segment with black hair; seventh with lateral red teeth. In the table in Trans. Amer. Ent. Soc., 1906, this runs to 8 on p. 81; it also runs to that vicinity (*i.e.* of *M. aurigenia* and *agilis*) in Robertson's table in Trans. Amer. Ent. Soc., 1905. It differs from *M. trinodis*, Rob., by the yellow on mandibles and other characters; from *M. agilis* and various other species it is readily known by the entire narrow median band (separated from the basal one by a black exposed area) on the second segment. In colour and general appearance (except for the much longer antennæ) it is curiously like an undersized *M. suffusa*, Cress., but the distribution of hair on the second abdominal segment and other characters are entirely different.

Hab. Fedor, Texas, June 17th, 1901 (Birkmann, No. 17). The name means golden-haired in a dialect of Ceram.

Melissodes loena, sp. n.

♂. Length about 12 mm.; hair of thorax, &c., ochreous, but not quite so bright as in *M. masuca*; clypeus (except the spots), labrum, and large spot on mandibles yellow; flagellum black above, clear ferruginous beneath; tegulæ shining ferruginous; nervures fuscous. In the characters of the head, thorax, &c., this is almost the same as *M. masuca*; were the abdomen removed, it would be hard to separate them. The maxillary blade is shorter in *loena*, the tegulæ are shining (dull in *masuca*), and the hind tibia is more slender, less densely

covered with hair, and red only at the apex. The venation is distinctly darker. The abdomen is conspicuously different, being narrower, with the hair-bands white. The hind margins of the segments are more transparent, so that the basal hair-bands can be seen through them. The first segment is very strongly punctured. From *M. kallstræmiæ phenacoides*, Ckll., this is readily known by the greyish-red (instead of green) eyes, the dark venation, the shorter tongue, the much less hairy hind tibia, and the white hair-band on segment five.

Hab. Lee County, Texas, November, 1908 (Birkmann, No. 15). The name *loena* is derived from a Malay word referring to flowers.

Boulder: April 1st, 1909.

THE ATHALIA GROUP OF THE GENUS MELITÆA.

By REV. GEORGE WHEELER, M.A., F.E.S.

(Continued from p. 115.)

WE must now pass to the named forms of other species than *athalia*, though it may be well to note in passing that Aurivillius in the 'Nordens Fjärilar' treats both *aurelia* and *parthenie* (called by him *parthenie* and *parthenoides* respectively) as varieties of *athalia*, on the ground of their mutual resemblance and specific variability. It is possible that this use of the name *parthenie* for *aurelia* elsewhere may account for the apparent confusion between the two species in many German authors, a confusion so great as often to leave one in doubt as to how many of the latter really know *parthenie* at all, a doubt which more rarely assails one when dealing with French or Swiss writers.

Deione var. *berisalensis* has already been somewhat fully dealt with, and the resemblance between the Swiss and the southern Spanish forms touched upon. I have, in fact, specimens from South Spain which I should certainly have supposed to come from Martigny, though they are perhaps slightly lighter in ground colour and the x -mark is not so defined as is usual in the more northern specimens. To my mind this resemblance appeals as a further confirmation of the specific identity of the two forms, and should they ever be proved to be distinct, the Southern Spanish race will have to be united with *berisalensis* and not with *deione*. It should perhaps be noted that Freyer's *deione* ('Neüere Beiträge,' vi. p. 21, pl. 493, fig. 1, 1852) is merely a small specimen of *parthenie*, which accounts for his unwillingness to allow it specific rank, as he was evidently unacquainted with the real insect.

There appear to be three named forms of *parthenie*, viz.: *aphæa* (Freyer nec Hübner), which has already been described (*antea*, p. 57), *jordisi*, Rühl, and *beata*, Caradja.

Var. *jordisi* is described at great length by Rühl in the 'Palaearktischen Grossschmetterlinge,' p. 413 (1893); the description is, in fact, so long that it is impossible to quote it *in extenso* in the original German, and we must content ourselves with a somewhat condensed paraphrase, thrown for the sake of convenience into the same form as the descriptions of the species and varieties previously given.

Up. s.: Ground colour much brighter red with strongly marked black nervures somewhat invaded in the central part of the f. w. by the ground colour; f. w.: border broad and of a deep black, all other markings wanting except a trace of the (?) inner subterminal on the inner margin, the outlines of the stigma and the basal lines, these giving the appearance of three spots of the ground colour surrounded with black. The up. s. of the female is lighter, with a light apical spot within the border, and the black nervures are nowhere overspread with the ground colour. (This light apical spot is here called by Rühl "characteristic of *parthenie*," but I have already, vol. xli. p. 223, quoted him as agreeing with me that it is sometimes present in other species, nor is it always to be found in *parthenie* female.)

Up. s. h. w.: border very broad and black including outer line; basal suffusion reaching to inner line, this leaving only one row of spots of the ground colour; basal spot small.

Un. s. f. w.: a broad black streak along the inner margin; only one of the usual lines (? the elbowed line) is present, and consists of clear black spots and streaks. In one female the black streak along the inner margin is nearly obsolete, and nearly all the spots of the elbowed line are radiate; there is also part of a row of yellow lunules along the outer margin, edged internally with black.

Un. s. h. w.: the usual banded arrangement nearly absent, the basal portion being red, the outer portion lemon-yellow, the two being separated by a bowed and indented black line; there are also four basal black spots; the inner edging line of the border is absent as in *asteria*, the outer being blacker and more sharply defined than usual; the black edging of the lunules of the terminal band is less arched but blacker than in the type; the outer band represented by a row of bright red spots partly round and partly triangular. In the female the inner edging line of the border shows in a rudimentary condition, the lunular part of the border being more distinct than in the male; the red spots of the outer band are reduced to centres surrounded by pale orange-red; the black basal spots very large and the dividing black line broader than in the male.

It will be seen that this form of *parthenie* corresponds with the *corythalia* form of *athalia*, but with the un. s. f. w. of *eos*, and it might well have been doubted whether it were not in fact this species, but variants of this form of *parthenie* are figured by Oberthür in the 'Bulletin de la Société Entomologique Française' for 1900, pp. 276-277, and if there is one author whose distinctions between *athalia* and *parthenie* are absolutely to be trusted it is Oberthür, as is shown by his paper in the 'Entomo-

logist's Record', vol. xv. p. 313. The original specimens from which Rühl's description was made came from Frankfort-on-Maine; it is also reported by Rondou from the Pyrenees, but he makes no mention of the underside. His description is as follows: "Fond des supérieures d'un rouge vif, sans la rangée médiane de taches noires; bord externe largement noir; inférieures d'un noir à peu près uniforme sauf la bande marginale."* This it will be seen hardly corresponds to Rühl's description, except with regard to the up. s. h. w., and it may well be doubted whether the form is really the same.

Var. *beata* is described by Caradja, 'Iris' vol. vi., p. 181 (1894), as follows: "In den Thälern der Pyrenäen bei Luchon, Sost, St. Béat, fliegt *parthenie* in einer sehr grossen, meist hellen Form, meine Stücke von dort messen im Durchschnitt 39 mm. (das grösste ♀ fast 41 mm.). Vielleicht verdient diese grosse lichte Lokalform mit einem Namen bezeichnet zu werden, als welche ich var. *beata* vorschlage."† Specimens in the British Museum collection from Vernet seem to be Caradja's *beata*, but there are others from Central France belonging to Sand's collection and very erroneously marked '*aurelia*,' which correspond completely with the above description.

[The name *polynome* is attached to certain specimens of *parthenie* in Schaufuss's collection which come from southwestern Europe. This name I have traced to Schneider ('Systematische Beschreibung,' p. 213), who refers it to Pillers und Mitterbachers 'Reisen,' pl. v. figs. 1, 2; this figure purports to be *maturna* which it certainly is not; so far as I can judge I should imagine it to have been taken from a specimen of *phæbe* with unicolorous ground, such as are found on the south side of the Alps, e.g. at Iselle or at Reazzino. It is certainly not *parthenie*.]

Varia, having been generally regarded as a variety of *parthenie*, has not directly given rise to any named forms. It seems, however, probable that Aurivillius' var. *norvegica*, 'Nordens Fjärilar,' p. 29 (1888), which is of course given by him as a variety of *athalia*, since he disregards all these specific differences, and which is referred by Staudinger to *aurelia*, should really be referred here; it is called *varia* by Lampa ('Tidskrift,' vi. p. 18, 1889), and it is erroneously suggested in the 'Entomologist's Record,' vol. xiii. p. 346, that on grounds of priority Lampa's name should stand, but the priority is with Aurivillius' name. If, however, I am right in my opinion that

* Ground colour of the f. w. of a bright red, the central row of black spots wanting, outer border broadly black; h. w. of an almost uniform black except the marginal band.

† In the valleys of the Pyrenees at Luchon, Sost, St. Béat, *parthenie* flies in a very large, mostly light form; my specimens from this locality measure 39 mm. across; the largest female almost 41 mm. Perhaps this large light local race ought to be distinguished by a name, for which I propose var. *beata*.

varia is quite distinct from *parthenie*, the correct designation of this form would be "*varia*, Bisch., var. *norvegica*, Auriv."

Britomartis having been already disposed of as certainly, and *dictynnoïdes* as probably, a distinct species, and *veronicae* having been provisionally considered under *athalia*, we are left with the unsatisfactory var. *rhætica* to treat as a variety of *aurelia*. It is thus described by Frey ('Lepidopteren der Schweiz,' p. 30 (1880)) : "Kleiner, lebhafter rothbraun weniger trüb, mit feineren schwarzen Zeichnungen, das ♀ nicht selten mit sehr lichten braunen Fleckreihen."* I speak of it as unsatisfactory, because the distinctions are so slight that it is difficult to separate it; specimens from the Rhone Valley, from Wiesbaden, and from Czernowitz, are scarcely distinguishable apart. The name should perhaps be reserved for the light Engadine specimens which were in the mind of the author, though these again can hardly be distinguished from the light females which occasionally appear among the Visp and Sion examples. The name is frequently, and wrongly, applied in Switzerland to smallish dark specimens.

Dictynna, though a very variable species, has not given rise to many varietal names. I have found but two : var. *vernetensis*, Oberthür, and ab. *seminigra*, Muschamp. After long searching I have been unable to find any reference to the former in Oberthür's published works, and can only trace it back to Rondou's 'Lépidoptères des Pyrénées,' p. 24 (1903), where the name is ascribed to Oberthür and the following description given : "Une race constante et très différente du type. Elle est beaucoup plus claire que dans les Hautes-Pyrénées, où elle ne diffère point de celles de la France centrale. Le dessus des quatre ailes est à peine plus obscur que chez *athalia*; aux inférieures la couleur fauve domine."† This is a very distinct form, showing much more of the ground colour than one meets with elsewhere, but it is still quite obviously *dictynna* even on the upper side; when placed by the side of *Reazzino britomartis* it rather serves to emphasize the specific distinctions of the latter.

Ab. *seminigra*, Muschamp, is shortly described as follows in the 'Bulletin de la Société lépidoptérologique de Genève,' i. p. 70 (1905) : "alis posterioribus nigris uno eodemque modo." The original specimens were taken on the Campolungo Pass, but it is by no means confined to this locality. I have specimens from various parts of Switzerland.

* Smaller, lighter red-brown, less dull, with narrower black markings, the female not rarely with very light brown rows of spots.

† A constant race and very different from the type. It is much lighter than in the Hautes-Pyrénées, where it is in no way different from those of Central France. The up. s. of both wings is scarcely darker than in *athalia*, on the h. w. the fulvous colour is predominant.

(To be continued.)

FIVE WEEKS IN THE VOSGES.

BY A. E. GIBBS, F.L.S.

(Concluded from p. 118.)

THE remainder of the holiday, which, on the whole, was in pleasing contrast meteorologically to the forest experiences, was spent at St. Maurice, every possible moment being devoted to entomology. During my absence one of my little girls had been working hard with her net, and had found out for herself the best way to catch *Euwanessa antiopa*. Near a farmhouse on the Ballon de Servance a cherry-tree grew beside the path, and at its foot was a runnel of water. *Antiopa* loves cherry juice, and quite a number of these fine insects could sometimes be seen feeding at the same time, descending occasionally to the water to drink, when they would fall an easy prey to the watchful hunter. Towards the end of our stay *Papilio machaon* began to get common. Soon after our arrival at St. Maurice, some larvæ were brought me which had been found feeding on the carrot foliage in the garden at the hotel, one of the pupæ being taken home to England by Mr. Barraud, who secured admirable photographs of it and the freshly emerged imago, and his pictures were hung at the annual exhibition of the Royal Photographic Society. Some beautiful specimens of *Apatura iris* were taken, chiefly in the mornings, sunning themselves on the branches of the hornbeams. Behind the cotton mill at the entrance to the Vallée de la Presle was a small thicket by the side of the stream, which was a favourite haunt of the regal butterfly, while on a clump of thistles close by *Dryas paphia* was almost sure to be found enthroned. Our last climb was to the summit of the Rouge Gazon, and was chiefly memorable for the abundance of fine dark females of *Argynnis niobe* var. *eris*, which were flying in the meadows above the forest.

The following is a dated list of our captures, all the localities being in the Department of the Vosges, unless otherwise indicated :—

Carcharodus althææ.—St. Maurice, June 28th.

Hesperia albeus.—St. Maurice, August 3rd; Vallée de l'Ognon (Haute Saône), July 10th.

Nisoniades tages.—Charmes, July 30th.

Pamphila sylvanus.—St. Maurice, July 9th and 31st; Rouge Gazon, August 2nd.

P. comma.—St. Maurice, July 31st, August 3rd.

Thymelicus lineola.—St. Maurice, June 28th and 29th, July 6th.

T. flavus.—St. Maurice, June 29th and onwards; Charmes, July 2nd.

Chrysophanus hippothoë.—St. Maurice, June 28th to July 8th; Ballon de Servance, July 5th and 22nd; Le Tholy, July 7th. Also

by Mr. Barraud, Ballon d'Alsace, July 2nd; Ternuay (Haute Saône), July 10th.

C. alciphron (type).—St. Maurice, June 28th to July 18th; Le Tholy, July 7th; Rouge Gazon, August 2nd; Vallée de l'Ognon, July 10th.

C. dorilis.—St. Maurice, August 3rd; Charmes, July 30th (very abundant); Luxeuil-les-Bains (Haute Saône), July 23rd.

C. phlaeas.—St. Maurice, July 3rd to August 3rd; Charmes, July 29th; Vallée de l'Ognon (Haute Saône), July 10th; Luxeuil-ies-Bains (Haute Saône), July 23rd.

Lycæna arion.—St. Maurice, abundant during the whole of our visit; Charmes, July 14th; Le Tholy, July 7th; Vallée de l'Ognon (Haute Saône), July 10th.

Cupido minima.—Charmes, July 14th.

Nomiades semiargus.—Abundant at St. Maurice, June 28th to August 3rd; Le Tholy, July 7th; Charmes, July 14th, 29th, and 30th; Ballon d'Alsace, July 2nd. Specimens from Charmes, July 30th, in which the wavy line of spots on the under side of the primaries is represented only by the three nearest the costa. Luxeuil-les-Bains (Haute Saône), July 23rd.

Polyommatus corydon.—St. Maurice, August 3rd; Charmes, July 29th.

P. hylas.—Ballon de Servance, July 22nd; only one specimen seen.

P. alexis.—June 28th to July 18th; Charmes, July 30th; Vallée de l'Ognon (Haute Saône), July 10th.

P. astrarche.—Charmes, July 30th.

Rusticus argus.—July 28th to August 3rd; Charmes, July 29th; Le Tholy, July 7th; Vallée de l'Ognon (Haute Saône), July 10th; Luxeuil-les-Bains (Haute Saône), July 23rd.

Everes argiades.—St. Maurice, July 21st and August 2nd; Charmes, July 14th, 29th, and 30th; Rambervillers, July 15th; near Melisey (Haute Saône), July 10th.

Cyaniris argiolus.—St. Maurice, July 21st (one only).

Zephyrus quercus.—Vallée de l'Ognon (Haute Saône), July 10th.

Thecla ilicis var. *cerri*.—Le Tholy, July 7th; Charmes, July 14th; Rambervillers, July 15th; St. Maurice, July 12th.

Papilio podalirius.—St. Maurice, June 29th (seen but not captured).

P. machaon.—St. Maurice, July 11th to end of visit. Some show much increase in depth of ground colour, becoming quite orange.

Parnassius apollo.—Ballon d'Alsace, July 26th.

Aporia crataegi.—Abundant on our arrival at St. Maurice, June 28th, and still on the wing when we left.

Pieris brassicae.—St. Maurice, July 31st and August 1st.

P. rapæ.—St. Maurice; first noticed July 2nd on the Ballon d'Alsace; a very yellow aberration, July 29th.

P. napi.—St. Maurice from June 30th to July 17th; Charmes, July 14th. Neither of the three species of *Pieris* was very abundant in the mountains.

Leptosia sinapis.—St. Maurice, July 5th, and becoming very abundant later in the month; Charmes, July 14th; Rupt-sur-Moselle,

July 23rd; Vallée de l'Ognon (Haute Saône), in great numbers, July 10th; Luxeuil-les-Bains (Haute Saône), July 23rd.—*Ab. erysimi*. St. Maurice, July 12th; Rambervillers, July 15th; by Mr. Barraud, Vallée de l'Ognon, July 10th.

Colias hyale.—Ballon d'Alsace, July 26th; St. Maurice, August 3rd; Charmes (abundant), July 29th; by Mr. Barraud, Ternuay (Haute Saône), July 10th.

C. edusa.—St. Maurice, July 9th, 12th, 21st, and 24th; Ballon d'Alsace, July 22nd; Charmes, July 29th; Vallée de l'Ognon (Haute Saône), July 10th; Luxeuil-les-Bains (Haute Saône), July 23rd.

Gonepteryx rhamni.—St. Maurice, July 2nd onwards; Charmes, July 30th; Vallée de l'Ognon (Haute Saône), July 10th.

Dryas paphia.—Common at St. Maurice throughout visit; Rambervillers, July 15th; Wesserling (Alsace), in great abundance, July 4th.

Argynnis aglaia.—St. Maurice, June 28th to August 3rd; Charmes, July 14th; Vallée de l'Ognon (Haute Saône), July 10th. Also by Mr. Barraud at Le Tholy, July 7th.

A. adippe.—Very fine forms at St. Maurice, June 28th to August 3rd; Wesserling (Alsace), July 4th. Var. *cleodoxa*.—St. Maurice, June 28th, and occasionally in July.

A. niobe.—St. Maurice, June 28th to August 3rd. Mostly var. *eris*, but some specimens of the type form were taken.

Issoria lathonia.—St. Maurice, June 28th, and occasionally throughout visit; Wesserling (Alsace), July 4th; Vallée de l'Ognon, and Col des Croix (Haute Saône), July 10th.

Brenthis euphrosyne.—Ballon d'Alsace, July 2nd.

B. selene.—St. Maurice, June 29th, and during July, especially on the Ballons; Charmes, July 29th and 30th. Mr. Barraud caught a remarkable specimen on June 28th at St. Maurice, in which the dark markings on the upper surface on the fore wing coalesced into irregular blotches.

B. daphne.—Wesserling (Alsace), July 4th; by Mr. Barraud, St. Maurice, July 3rd.

B. ino.—St. Maurice, June 29th, and throughout July, especially at the higher elevations; large female, 45 mm., Ballon de Servance, July 22nd.

B. dia.—St. Maurice, June 28th to August 3rd; Le Thillot, July 10th; Rupt-sur-Moselle, July 23rd; Vallée de l'Ognon (Haute Saône), July 10th.

Melitæa didyma.—St. Maurice, June 29th, and throughout July; Wesserling (Alsace), July 4th; by Mr. Barraud, Haut du Them (Haute Saône), July 10th.

M. parthenie.—St. Maurice, June 28th, 29th, and 30th.

M. athalia.—St. Maurice, June 28th to July 25th; Le Tholy, July 7th; Charmes, July 14th; Ballon de Servance, July 2nd; Ballon d'Alsace, July 26th; Rambervillers, July 15th; Luxeuil-les-Bains (Haute Saône), July 23rd; Wesserling (Alsace), July 4th.

M. dictynna.—St. Maurice, June 29th and 30th, and July 1st; Ballon de Servance, July 2nd.

Arachnia var. *prorsa*.—Ternuay (Haute Saône), July 10th; St.

Maurice, July 11th; Rupt-sur-Moselle, July 23rd; Ballon d'Alsace, July 26th.

Pyrameis cardui.—Charmes, July 29th.

P. atalanta.—St. Maurice, July 25th.

Euvanessa antiopa.—St. Maurice, single specimen July 11th; becoming abundant, July 25th and onwards; Correvillars (Haute Saône), July 23rd.

Vanessa io.—St. Maurice, July 11th onwards; Ballon de Servance, July 5th.

Aglais urticae.—St. Maurice, July 2nd onwards. Remarkably large and bright specimens, one measuring 59 mm., on the Ballon d'Alsace, July 2nd.

Eugonia polychloros.—Le Tholy, July 7th; St. Maurice, June 29th, and becoming abundant later.

Polygonia c-album.—Abundant the whole time of our visit.—Var. *hutchinsoni*.—St. Maurice, June 30th and July 22nd.

Limnitis populi var. *tremulæ*.—Ballon d'Alsace, July 2nd, by Mr. Barraud.

L. camilla.—St. Maurice, June 28th and 29th, July 11th and 12th; Le Tholy, July 7th; Wesserling (Alsace), July 4th.

L. sybilla.—Rather abundant throughout the district, but in poor condition; June 28th and onwards.

Apatura ilia ab. *clyte*.—Charmes, July 14th.

A. iris.—St. Maurice, July 8th onwards; Ballon d'Alsace, July 2nd; Charmes, July 14th; by Mr. Barraud, Le Tholy, July 7th.

Pararge mæra.—St. Maurice, June 28th to end of July; Le Tholy, July 7th.

P. megæra.—Charmes, July 29th.

P. egeria.—Charmes, July 29th; Luxeuil-les-Bains (Haute Saône), July 23rd.

P. achine.—Charmes, July 14th; Rambervillers, July 15th.

Enodia dryas.—Rambervillers, July 15th (one).

Hipparchia semele.—St. Maurice, July 17th, 26th, and 28th; Charmes, July 29th; by Mr. Barraud, St. Maurice, July 5th.

Epinephele jurtina.—Abundant at St. Maurice during the whole of our stay; Vallée de l'Ognon (Haute Saône), July 10th; by Mr. Barraud at Le Tholy, July 7th.

E. tithonus.—Charmes, July 29th and 30th; Luxeuil-les-Bains (Haute Saône), July 23rd.

Aphantophus hyperanthus.—St. Maurice, June 28th onwards.

Cænonympha arcania.—Le Tholy, July 7th; Charmes, July 14th.

C. pamphilus.—St. Maurice, June 28th onwards; Charmes, July 30th.

C. typhon.—St. Maurice, July 25th (one only).

Erebia epiphron.—Ballon d'Alsace, July 26th.

E. stygne.—St. Maurice, June 28th onwards. In places the most abundant butterfly.

E. ligea.—St. Maurice, July 1st onwards. Not taken below about 2000 ft.

FOUR NEW SPECIES OF THE GENUS *ERETMA- PODITES* (THEOBALD) FROM ASHANTI.

BY W. M. GRAHAM, M.B.,

Director Medical Research Institute, Lagos.

(Concluded from p. 89.)

3. *Eretmapodites chrysogaster*, nov. sp.

♂. The head is covered, as in No. 1, with dense parti-coloured flat scales in front, and in a triangular area behind with golden, narrow-curved, and black upright and golden upright forked scales. Six bristles project forward between the eyes, the anterior pair being golden in colour.

Antennæ: Plumose, the verticillate hairs pale brown. There are a few black scales on the basal segment, and the second segment is scaled also. The two apical segments are three times the length of the others.

Palpi: Thin, acuminate, shorter than proboscis, without plum hairs, black. Proboscis: Long, thin, blue-black, curved apically. Clypeus: Dark brown, nude.

Thorax: The mesonotum is covered with mingled black, narrow-curved and golden, narrow-curved scales. Three parallel longitudinal narrow black bands run backward over the central portion, the median black band being continued to the scutellum by a band of golden scales. The edge of the mesonotum is surrounded by an interrupted border of golden scales.

Scutellum: The middle lobe is covered with a median band of white and two lateral bands of purple flat scales. There are four long bristles and some shorter ones on the edge. The lateral lobes are covered with golden, narrow, and black, narrow-curved scales.

Pleuræ: A dark golden colour, with patches of silvery white flat scales on meso- and meta-pleura, as in No. 1. The prothoracic lobes are covered with dense silvery white flat scales, and the apex of the prosternum with similar scales, as in No. 1.

Halteres: Base pale, stalk and knob covered with bluish flat scales. Metanotum: Brown, with five hairs and a few golden, narrow-curved scales at the apex.

Abdomen: The venter is pale golden, with apical black bands on the fifth, sixth, and seventh segments. The dorsum and sides are velvety black, with triangular lateral white spots, the apex of the triangle being towards the dorsum and the base resting on the edge of the golden venter. There is an apical, dorsal, silvery band on the seventh segment.

Legs: A blue-black, with apical white bands on the femora of the third pair. The last two segments of the hind tarsi are feathered with elongated black scales.

Ungues: First pair equal, one simple, one uniserrate; second pair same as first pair; third pair equal, small, simple. The last segment of the tarsus of the first and second pairs has a stout tooth

or thorn on the ventral surface inserted immediately behind the joint. There is no such tooth on the tarsus of the third pair.

Wings: Very darkly scaled with Trichoprosopon-like scales, bluish and markedly ribbed. First submarginal cell one-fourth of its length longer than the second posterior cell. The stem of the first submarginal is about two-thirds the length of the cell. The supernumerary and mid cross-veins are close together, the posterior about its own length towards the base of the wing. The sixth vein turns at right angles to the costa just before its termination.

Genitalia: The claspers are long, curved, and without terminal articulate spine, covered, the basal half with scales, the distal half with seven long hairs. The harpes are long, curved, and expanded into a flattened blade tapering to a rounded point.

Length: 5 mm.

♀. Head as in male. Antennæ: Much less plumose; otherwise similar to those of the male. Palpi: Short, black-scaled, acuminate.

Proboscis, clypeus, thorax, scutellum, pleuræ, prothoracic lobes, halteres, metanotum: As in male.

Abdomen: As in male, and with the dorsal silvery band on the seventh segment complete.

Legs: As in the male, but the last two segments of the hind tarsi are of normal form, *i. e.* unfeathered.

Ungues: First pair equal, uniserrate; second pair equal, uniserrate; third pair equal, simple.

Wings: Colour and scales as in male. First submarginal cell one-fifth of its length longer than the second posterior cell. The stem of the first submarginal is usually one-third the length of the cell. The supernumerary and mid cross-veins are close together, the posterior about its own length towards the base of the wing. The sixth vein is as in the male.

Length: 6 mm.

Habitat. Obuasi, Kumasi, Dompooasi; taken in bush August to November. Also reared from larvæ taken in a small collection of water in the hollow of a tree near Dompooasi, Aug. 14th.

4. *Eretmapodites melanopous*, nov. sp.

♂. Head, antennæ, palpi, proboscis, clypeus: As in No. 3.

Thorax: As in No. 3, but the ground colour is somewhat darker brown, and black scales predominate.

Scutellum, pleuræ, halteres, metanotum: As in No. 3.

Abdomen: Is a velvety black, with basal white ventral banding, the bands showing laterally, and gradually becoming more apical till the apex is white ventrally on the sixth segment. There is a yellow spot on the sixth and seventh segments of the venter. The white banding becomes dorsal on the seventh segment, but the lateral spots do not meet in the middle line.

Legs: As in No. 3, but the hind tarsi are unfeathered.

Ungues: First pair unequal, simple; second pair unequal, simple; third pair equal, simple. The terminal segment of the tarsus of the first pair has two strong teeth inserted immediately behind the joint.

The terminal segment of the second pair has two short thick teeth, differing in shape and insertion from those of the first pair. There are no teeth on the tarsi of the third pair.

Wings: As in No. 3, but first submarginal cell is about one-third of its length longer than the second posterior, and the stem of the first submarginal cell is about one-half the length of the cell. The supernumerary and mid cross-veins are close together, the posterior cross-vein about its own length towards the base of the wing.

Genitalia: The claspers are long and curved and without terminal articulate spine, and generally as in No. 3.

Length: 5 mm.

♀. Head as in male. Antennæ; Less plumose, and as in female, No. 3. Palpi: Short, black, acuminate.

Abdomen: As in male almost exactly, the dorsal silvery band on the seventh segment being incomplete in the middle line, as in male.

Legs: As in male.

Ungues: First pair equal, uniserrate; second pair equal, uniserrate; third pair equal, simple.

Wings: As in male, but first submarginal cell is one-fourth of its length longer than the second posterior cell, and the stem of the first submarginal cell is somewhat more than one-third the length of the cell. Cross-veins as in the male; sixth vein as in the male.

Length: 6 mm.

Habitat. Obuasi in June, July, August, October, and November, in bush, between 11 a.m. and 3 p.m.

NOTES AND OBSERVATIONS.

NONAGRIA NEURICA IN THE MADDISON COLLECTION.—I see the 'Entomologist' on p. 124 records that the late Mr. Maddison's melanic *Nonagria neurica* came from Horning. This was an error in the label, as these *N. neurica* came from myself, and were not Norfolk specimens. So far as I know, melanic examples of *N. neurica* have not been taken at Horning, where Messrs. Bowles, Edelsten, and myself have taken very many specimens of the typical form.—A. ROBINSON; 5, King's Bench Walk, Temple, E.C., May 4th, 1909.

SATURNIA PAVONIA, ab.—Yesterday I captured a rather remarkable variety of *Saturnia pavonia*, which I should describe as a "blind" variety, as it has the spots where the eyes usually are blank. This is probably the rare variety mentioned in 'Moths of the British Isles.' The spots on all four wings are identical. The centres are filled in with pale fuscous colour, with no shading whatever. I took the specimen on the Quantock Hills near here. It is a fine male. By the way, the species seems well-established here, as I saw over two hundred in just over an hour and a half.—W. A. BOGUE; The Bank House, Watchet, Somerset, May 3rd, 1909.

GYNANDROUS AMORPHA POPULI.—Although I believe gynandrous specimens of *A. populi* are, comparatively speaking, common, it may be of interest to record that I have just bred a very fine one, left side

male, right female. The right-hand wings are longer and narrower than those on the left, giving the insect a slightly lop-sided look; their colour, too, is very much duller and browner than those on the male side. The antennæ correspond, that on the left being much stouter and longer and much more strongly pectinated than that on the right; also the legs, those on the male side being much stouter and more hairy than the corresponding female ones. There is also a distinct ridge or dividing line down the exact centre of the body, the shade of colouring on either side matching the wings, and the male anal tuft is confined to the left side; so that it seems to be a fairly evenly divided insect. I bred it from a larva found here last year.—P. A. CARDEW (Capt.); St. Aldwyns, Park Avenue, Dover, May 10th, 1909.

CATOCALA FRAXINI IN SUSSEX.—A fine female of this species was taken at rest on the trunk of an old poplar near the railway-station at Horsham, on Sept. 3rd, 1908, by Mr. A. James, of Tooting Groove. The moth was placed in a muslin cage, fed with syrup on a sponge, and obligingly laid about one hundred and twenty eggs, after knocking itself about somewhat in a vain attempt to escape, having in view, I suppose, that something more succulent than dry muslin to eat would be necessary for its future progeny. The ova, some of which I have in my possession, commenced to hatch on 4th inst., and some few have not yet hatched (14th inst.). A few of the larvæ are now in the second instar, but I regret that rather a large percentage of the young larvæ died in moulting. I had an opportunity of inspecting the parent moth; it was also exhibited, I understand, at the South London Entomological Society in April. I am informed that there have been several captures of this exceedingly rare species in Surrey and Sussex during the past few years.—J. J. JACOBS (Lieut. R.E.); Gillingham, Kent, May 14th, 1909.

A NATURE STUDY EXHIBITION, organised by the Nature Study Society, will be held at the Royal Botanic Gardens, Regent's Park, N.W., on Friday and Saturday, June 4th and 5th. Open each day from 10 am. to sundown. It will include Aquaria, Vivaria, and other means of observing animals, with photographic and microscopic illustrations. Tickets and all particulars may be obtained of Miss WINIFRED DE LISLE, Hon. Sec. of the Committee, 58, Tyrwhitt Road, Brockley, S.E.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA IN MAY.—I saw a specimen of *Colias edusa* to-day.—FRANK W. FISHER; Cranborn, Salisbury, May 19th, 1909.

NOTES FROM THE SOUTH MIDLANDS.—My brother took a male specimen of *Cerura bifida* on a poplar-trunk at Peterborough yesterday (April 26th). On the same day a *Notodonta dromedarius* taken in the district emerged in my breeding-cage. The season has been very early this year. Sallow was almost over here before it came out in the New Forest or in Sussex, and I have Feb. 5th as a date for *Hybernia leucophaæaria* and *Lycia (Biston) hirtaria*. *Teniocampa*

miniosa was extremely abundant in the Northants woods this year, and I took some very unusual varieties of *T. munda*. *Apocheima hispidaria* taken near Bedford Purlieux on March 18th seems a new locality. I believe it is not previously recorded in the district.—C. MELLOWS; Brasenose College, Oxford.

ACHERONTIA ATROPOS IN MAY.—On the evening of the 10th inst. a working-man brought me one of these moths, which had just settled on his trousers below the knee, and had then run up his leg as he was walking in the street. When he caught it in his hand he said "it squeaked just like a mouse," and he was rather afraid of it. However, he took it home and placed it under a tumbler, and then brought it to me. It was a male, and rather a fine dark one, and would have been quite perfect but for a piece chipped out of one of its hind wings, doubtless by its captor. I kept it in a breeding-cage all night, and released it the next evening as soon as it began to move about, and it looked like a small bird as it flew off in the gloom. The species is not often seen at this time of the year in Britain.—GERVASE F. MATHEW; Dovercourt, May 12th, 1909.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 17th, 1909.*—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Capt. E. Bagnell-Purefoy, The Cottage, East Farleigh, Maidstone; Mr. Stanley A. Blenkarn, 44, Romola Road, Tulse Hill, S.E.; Mr. Leonard Box, the Floral Nurseries, Hailsham, Sussex, and 28, St. James's Street, Bedford Row, W.C.; Mr. Henry Britten, Prospect House, Salkeld Dykes, Penrith; the Rev. C. R. N. Burrows, of Mucking Vicarage, Stanford-le-Hope; and Mr. W. A. Rollason, "Lamorna," Truro, were elected Fellows of the Society.—M. A. Janet, member of the Entomological Society of France, and M. Severin, member of the Entomological Society of Belgium, were present as visitors.—Mr. H. Rowland-Brown exhibited two extreme forms of *Chrysophanus phlæas* from Norwegian Finmarken and the Mediterranean region, drawing attention to the apparent identity of the form from Arctic Europe—*hypophlæas*—with the species described as *americanus* from North America. He also showed series of *Plebeius argyrognomon*, Brgstr. taken by him at Alten and Abisko, Swedish Lapland; *P. argus* var. *corsica* from Corsica; and *P. argus*, approaching var. *bella*, H. S., from Digne, Basses-Alpes.—Mr. H. Hamilton Druce also brought for exhibition examples of *Plebeius argus*, L., taken by him in various localities in Russia.—Mr. G. Meade-Waldo exhibited a gynandromorphous example of *Euchloë cardamines*, bred from a larva found at Hever, Kent.—Mr. H. M. Edelsten brought for exhibition stereoscopic photographs of the anal segments of *Canobia rufa*, female, showing the spines which are driven into the dead stems of *Juncus lamprocarpus* during oviposition.—Mr. W. Schmassman showed, on behalf of Mr. H. Welte, a curiously marked female of *Chrysophanus hippothoë* from Goeschenen, Switzerland. The black spots, forming the marginal row on the under side of the two

fore wings and one of the hind wings, were elongated. The other hind wing and the wings on the upper side were normal. Mr. C. O. Waterhouse sent for exhibition living males and immature females of the mammoth scale-insect which infests the M'sasa tree in Rhodesia: also a dead example of the fully-grown female scale. They are what are known in collections under the generic name *Monophlebus*. The female has been named *Lophococcus maximus* by Mr. Lounsbury.—Mr. E. A. Butler exhibited one species of Coleoptera, and five of Hemiptera, recently added to the British Fauna; also the unique example of *Mymecocoris gracilis*, Sahlb., taken by him at Fleet, Hants, in August, 1903.—Mr. E. J. Arrow exhibited examples of a Cetoniid beetle, *Dicronorrhina* (subg. *Neptunides*) *manovens* Moser, to show injuries of a remarkable character. In all the marks were perfectly symmetrical and occupied exactly the same position.—Dr. K. Jordan exhibited the polymorphic *Papilio lysithous* and *P. hectorides* from Brazil, and the models which they imitate. The exhibit illustrated a phenomenon observed in various groups of butterflies: that a mimetic species is broken up into a number of very different-looking individual varieties, which are all specifically the same, while the imitated models are specifically distinct from one another. He also exhibited both sexes of the peculiar Peruvian butterfly, *Styx infernalis*, described by Staudinger as a Pierid, but certainly an Erycinid in the structure of the antenna, thorax, legs, neurulation, and the egg. Dr. Jordan also showed, on behalf of the Hon. N. Charles Rothschild, an *Acrotylus* which Mr. Rothschild had observed in some numbers in the desert on the Upper Nile. The colour of these small locusts so closely agrees with that of the sand and the pebbles (also exhibited) that, when settled, the insects disappear entirely from view.—Mr. J. W. Tutt opened a discussion on the affinities of the two Palearctic species, *Plebeius argus*, L. (*agon*, Schiff.; *argyrotozus*, Brgstr.) and *P. argyrognomon*, Brgstr. (*argus* auctorum). After giving an account of the confusion in nomenclature, he proceeded to explain the structural and superficial differences of the respective imagines. It was also remarkable to note that both showed a parallel range of varieties in the mountain, plain, and southern forms. Dr. T. A. Chapman then gave a demonstration with the lantern, illustrated by many slides, of the structural differences of the two species in the larval and imaginal stages, and criticized the opinion expressed by Staudinger that *argus* and *argyrognomon* have not yet entirely developed into separate species. The microscopic preparations showed that the "claw" or spine over the front tibiæ in *argus* was not even represented in rudimentary form in *argyrognomon*.

Wednesday, April 7th.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. R. Shelford exhibited a number of examples of mimetic Blattidæ, the models being Coleoptera, principally Coccinellidæ, and Chrysomelidæ.—Mr. H. M. Edelsten showed some ova of *Tapinostola fulva* (*in situ*) laid within the curled leaf of *Carex paludosa*; also a photograph of the anal segments of the female, showing the ear-like appendages, from the ventral side. These, when not in use, are carried flat, but when the female is going to lay, they are folded together and thrust between the curled edges of a leaf to force it apart; the fold makes a hollow in which the ova are

deposited; and the leaf closes over the ova when the appendages are withdrawn. The discussion on the two similar species, *Plebius argus* and *P. argyrognomon* was resumed and concluded.—Mr. H. St. J. Donisthorpe read a paper "On the Origin and Ancestral Form of Myrmecophilous Coleoptera."—Mr. W. L. Distant communicated a paper on "Rhynchota Malayana."—Mr. J. E. Collin communicated a paper by Mr. Wesché "On the Antennæ of Diptera, and the Present Classification of the *Nemocera*, with two subsidiary sections bearing on the latter subject."—Mr. G. A. K. Marshall then read a paper entitled "On Reciprocal Mimicry. A Rejoinder to Dr. F. A. Dixey." Dr. Dixey had taken the view that within the limits of a Müllerian association every species exercises a mimetic influence upon every other, the amount of the influence depending upon its dominance, which is determined by its numbers, distastefulness, and general notoriety. Thus, as between any two species, the mimetic approach would be mutual and result in an interchange of characters. This interchange would be proportionate to the relative dominance of the two species; where this is unequal, the weaker species would take on, to a considerable extent, the superficial appearance of the stronger, while the latter would adopt only some small characters from its mimic; but where the dominance is equal, the interchange would be equal, so that this would constitute the optimum condition for the production of reciprocal mimicry. On the other hand, Mr. Marshall contended that this gravitational conception of mimicry was really based on a false analogy and was at variance with the real principle of Müller's theory. While admitting the theoretical possibility of mimetic interchange, he urged that a logical application of Müller's argument would lead to the view that mimetic approach would be one-sided only, that is, from a weaker species towards a stronger and even in an opposite direction; further, that when the relative dominance of the two species was equal, the mere operation of Müller's factor would produce no mimetic effect until some other factor had first produced a condition of inequality. On this view mimetic interchange would never be mutual and simultaneous, but would only result from a complete reversal of the relative dominance of the two species during the production of the mimetic resemblance. For this process he had suggested the name of "Alternate Mimicry." Mr. Marshall said also that he was compelled to reject entirely Dr. Dixey's new hypothesis as to the "function of the double aposeme," because it completely left out of consideration the differences and resemblances between the various forms regarded from the standpoint of general facies; he contended that resemblance in general effect was of the first importance in considering mimetic relationship, and that this new hypothesis was liable to be extremely misleading on account of the exaggerated significance which it attached to the merely partial resemblance which might be said to exist between two species possessing a single conspicuous feature in common but differing markedly in other respects. Moreover, not only was the theoretical position of Reciprocal Mimicry very unsatisfactory and unconvincing, but, further, the cases which had been cited as proving its actual occurrence in nature appeared open to serious criticism. For while in some cases the facts did not appear to justify the assertion that an

interchange had taken place, in the others such an interpretation involved many difficulties which disappeared when the mimetic phenomena were interpreted as being due to the simple mimicry of one form by another. Dr. Dixey stated that he did not consider the Presidential chair to be a proper place in which to reply to Mr. Marshall's criticism, and that he would therefore deal with the points at issue on some future occasion. Mr. C. J. Gahan very strongly supported the opinions advocated by Mr. Marshall, and expressed the view that while Dr. Dixey professed to support Müllerian mimicry yet his defence of Reciprocal Mimicry really constituted a severe attack upon that theory. Mr. S. A. Neave said that as a result of his field experience in Africa he was unable to accept the theory as to the function of "double aposemes," but he did not mean thereby to imply that he rejected every case of Reciprocal Mimicry. He suggested that Alternate Mimicry might not be so uncommon a phenomenon as Mr. Marshall appeared to think. Mr. Tutt, Mr. W. E. Sharp, and Professor Hudson Beare also made some brief comments on the subject.—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 11th, 1909.*—Mr. A. Sich, F.E.S., President, in the chair.—Mr. West (of Greenwich) exhibited another section of the Society's reference collection which he had remounted and arranged.—Mr. South, a short series of *Acidalia degeneraria* received from Mr. J. Walker, of Torquay, and pointed out that they were lighter in colour than the Portland form.—Mr. Newman, specimens of *Cleora angularia* (*viduaria*), a pair of *Phibalapteryx polygrammata* ab. *olivacea*, and ab. *obsoleta* of *Camptogramma fluviata*, and four melanic examples of *Notodonta ziczac*.—Mr. Kaye, a drawer of aberrations and geographical races of *Cosmotriche potatoria*.—Messrs. Tonge, Harrison, Main, Joy, Moore, Grosvenor, Pickett, Turner, Dr. Chapman, Dr. Hodgson, and Rev. G. Wheeler, a large number of species, races, and forms of the "blue" butterflies to illustrate Mr. Tutt's remarks on the family. Mr. Tonge also exhibited photographic life-histories of the "blue" butterflies. Mr. Tutt then gave a "Gossip on the Blue Butterflies," summarising all that was known of their life-histories and relationships, pointing out modern ideas of the grouping, and emphasizing the necessity of the genera being based upon the sum total of our knowledge of the species and their habits in all stages.

March 25th.—The President in the chair.—Mr. A. E. Gibbs, F.E.S., of St. Albans, Mr. A. W. Buckstone, of Chiswick, and Mr. J. H. Rohde, of Reigate, were elected members.—Mr. G. B. Brown exhibited specimens of *Eubolia bipunctaria* from Branscombe and Dawlish, and pointed out their reddish suffusion compared with specimens exhibited from Horsley. He also showed specimens of *Agriades corydon* having slight reddish suffusion.—Mr. Hy. J. Turner, a box of butterflies recently obtained from Columbia.—Mr. Tonge, an under side of *Acronycta psi*, in which the central black spot was produced towards the base as a line.—Mr. Bowman, a very pale female of *Nyssia hispidaria* from Chingford.—Mr. Coote, ova of the same species, and a female specimen of *Anisopteryx acularia*.—Mr. Kaye, specimens of *Chrysophanus dispar*, and a short series of *Xylina furci-*

fera (conformis).—The remainder of the meeting was devoted to an exhibition of lantern slides by Messrs. Tonge, Dennis, West (Ashtead), Main, Step, and Lucas.

April 8th.—The President in the chair.—Mr. Hemmings and Mrs. Hemmings, of Horley, were elected members.—Mr. Newman, a living female of *Asteroscopus nubeculosa*, bred that morning after being four years in the pupal stage.—Mr. Main, ova-cases of a leaf insect from Ceylon, each containing one ovum. The species was parthogenetic, males being rarely produced.—Mr. Turner, a series of the delicate Pyralé *Glyphodes sinuata* from the Ja River, Cameroons.—Mr. Adkin read a short paper entitled “Notes on a Series of *Boarmia repandata*, with some Remarks upon the Variation and Distribution of the Species in Britain,” and exhibited long series of the species in illustration of the paper.—Mr. Turner read the Report of the Society’s Visit to the Zoological Museum, Tring, on March 27th. About thirty members and friends were present.

April 22nd.—The President in the chair.—Mr. Tonge exhibited remains of an unusually dark *Catocala fraxini*, taken at Horsham in 1908, with some of the ova laid by it.—Mr. West (Ashtead), living larva of a stick-insect, feeding on privet-leaves.—Mr. Joy, a pupa of *Cyclopides palæmon*. The larva hybernated from mid-October in a tent among grass, emerged in the spring, wandered but did not feed, and had just pupated. He referred to a brood of *Brenthis euphrosyne*, of which, on March 15th, forty-five out of about eighty were alive. The subsequent severe weather killed off all but four, of which two had already turned to pupa.—Mr. Rayward, ova *in situ*, found wild, of *Polygonia c-album*. They were always near the apex of the leaf on the upper side.—Mr. Tonge read a paper, “The Resting Positions of Butterflies and Moths,” illustrating his remarks with a large number of admirable lantern-slides, many of them from photographs taken on the occasions of the various field meetings of the Society.—HY. J. TURNER, *Hon. Rep. Sec.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*February 16th, 1909.*—Exhibits were practically confined to *Pseudoterpna cytisaria*, which was the subject of the paper appointed to be read on this occasion by Rev. C. R. N. Burrows.

March 2nd, 1909.—A special exhibit of *Polyommatus phlæas* was the feature of the evening. Dr. T. A. Chapman exhibited various European and extra-European series, including examples from Sicily (? spring brood) lighter in colour and with black markings less pronounced than in normal English specimens; from Spain (? summer brood), mostly var. *eleus* or abs. approaching thereto; from Teneriffe with black markings accentuated as regards both size and depth of colour, but with ground colour clear and bright; from Japan, some with ground colour and others with same suffused with black; and from India, all with ground colour completely obscured with smoky suffusion. English specimens, with copper marginal band on hind wings broken up into alternate dashes of copper and black, were exhibited by Messrs. S. J. Bell and L. W. Newman, while Mr. J. E. Shaw showed an ab. with entirely black hind wings from Darenth, and var. *eleus* from Bexley.—Mr. H. M. Edelsten, *Camptogramma*

fluviata bred from South Devon female, the larvæ having all pupated (save two) on one day, and the imagines having all (save two) emerged during one day. — Mr. J. Riches, larvæ of this species fed on dandelion in a hot-house; also a specimen of *Arctia caia* with usual black markings on hind wings restricted to three marginal blotches. — Mr. A. J. Wellsdon, *Phigalia pedaria*, bred from wild Yorks melanic female; about ten per cent. of the brood were melanic, a few light-coloured, and the rest intermediate forms. — S. J. BELL, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, March 15th, 1909.—Mr. C. E. Stott, Vice-President, in the chair. — A paper was read by Mr. H. R. Sweeting entitled "The Value of Variation to a Species." — Mr. W. Mansbridge exhibited specimens of *Amphidasys betularia*, and its variety *doubledayaria*, which had been bleached by exposure to chlorine; also *A. strataria*, which had been kept alive in an atmosphere containing a considerable amount of chlorine for forty-eight hours, also a specimen which had been killed in a strong atmosphere of chlorine. In the former experiment, *A. strataria*, compared with a check specimen, showed no bleaching, but in the latter the insect died in one minute, and the dark markings were at once bleached to light brown.—Mr. C. E. Stott communicated notes on recent additions to the local list of Coleoptera, and exhibited, on behalf of Dr. Knight, of St. Annes, a tube containing a number of Glossiniæ (tsetse flies). — Mr. W. A. Tyerman exhibited *Agrotis exclamationis* var. *nigra* and a specimen of *Aplecta occulta* from Ainsdale.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—March 3rd, 1909.—The President, Mr. C. F. Johnson, in the chair.—Mr. J. E. Cope read a paper, "Coleoptera, with special reference to the family Lamellicornia," illustrating his remarks on their structure with several well-dissected specimens, and showed various species lent by Mr. J. Ray Hardy.—Mr. L. Nathan exhibited an orthopteron—*Blatta americana*—taken in Princess Street, Manchester. — Mr. A. W. Boyd, part of an autumn brood of *D. pudibunda* (Delamere ova).—Mr. J. B. Garnett, entomological apparatus.

April 7th, 1909.—The President, Mr. C. F. Johnson, in the chair. —Mr. W. Mansbridge, F.E.S., exhibited long and varied series of *Peronea hastiana* from Wallasey, and of *Pædisca corticana* from Delamere and St. Annes. — Mr. C. Clark, *G. papilionaria*. — Mr. J. E. R. Allen, M.A., a series of *H. leucophæaria* from Kent.—Mr. N. H. Davison, a series of *Phigalia pedaria*; types and var. *monacharia*; *H. leucophæaria*, including two very dark forms; and *O. vaccinii*—all from Dunham Park, Cheshire, this spring.—Mr. B. H. Crabtree, F.E.S., *C. dominula* (yellow form); *A. villica*, with large cream tips to the fore wings; *A. grossulariata* vars. *chalcocoma* and *lacticolor*.—Mr. R. Tait, Jr., series of *A. nebulosa*, types and vars. *robsoni* and *thompsoni* from Delamere; series of *E. prasina* (*herbida*), Nov. 1908, Brockenhurst.—A. W. BOYD, B.A., *Hon. Sec.*

RECENT LITERATURE.

A Guide to the Natural History of the Isle of Wight. Edited by FRANK MOREY, F.L.S.; with contributions (on Insecta) by MALCOLM BURR, B.A., F.E.S., F.L.S., F.Z.S., F.G.S.; W. J. LUCAS, B.A., F.E.S.; CLAUDE MORLEY, F.E.S., F.Z.S.; E. A. NEWBERRY; HORACE ST. J. K. DONISTHORPE, F.Z.S., F.E.S., &c.; E. A. BUTLER, B.A., B.Sc., F.E.S.; and HUBERT F. POOLE. Pp. xx, 560; with Map. Isle of Wight: The County Press, Newport. London: William Wesley & Son. 1909.

THIS bulky volume deals with the whole of the natural history of the island, and, considering that it is but some three years since the project was initiated by the editor, we consider that the result goes far to show him worthy of the trust suggested by its production. Fuller working of the central inland districts, and especially of the woods and open ground, would add considerably to the various faunistic lists, since the heel of the invader from dingier climes is shown all along the coast-line, more particularly at the "back" of the island. But the resident naturalists are few, though all such appear to have most liberally assisted in the satisfactory issue, which is evidenced by the totals:—Orthoptera, 23 species; Neuroptera, 29 species; Hymenoptera, 472 species; Coleoptera, 1434 species; Lepidoptera, 972 species; Diptera, 281 species; and Hemiptera, 324 species. All these, however, are obviously open to augmentation, and we trust those who sojourn or have sojourned in Vectis will comply with the editor's request, suffixed to his excellent Preface, for further information upon their especial groups.

C. M.

Catalogue of the Lepidoptera Phalaenæ in the British Museum. Vol. vii. By Sir GEORGE F. HAMPSON, Bart. Pp. i-xv, 1-709; with Atlas of fifteen coloured plates. London: Printed by Order of the Trustees. 1908.

THE bulky volume under notice, which is the fourth dealing with the classification of the Noctuidæ, treats of the Acronyctinæ. The author states that, as there are about three thousand species belonging to over three hundred genera referable to this subfamily, their consideration will occupy two other volumes, in addition to the present one in which over eight hundred species and rather less than one hundred genera are entered and described. Thirty-seven of the genera have each but one species, and sixteen others have thirty-six species between them; three genera (*Trachea*, *Perigea*, *Eriopus*), on the other hand, embrace a total of two hundred and seventy species.

In *Trachea*, Ochsenheimer, = *Achatia*, Hübner, Tent. (t. *atriplicis*, L.), are merged *Phosphila*, Hübner. (t. *turbulenta*, Hübner.), *Hama*, Steph. (t. *anceps*, Schiff.), *Berrhæa*, Walk. (t. *aurigera*, Walk.), *Chandata*, Moore (t. *partita*, Moore), and *Epa*, Beth.-Baker (t. *pratti*, Beth.-Baker).

According to our author, *nigricans*, Vieweg, is an earlier name for *abjecta*, Hübner, but is not eligible in this connection; he, however,

rescues *oblonga*, Haworth (1809), from the obscure position assigned it by Stephens and others, as a form of *gemina*, Hübner, and adopts it as a prior name for the species known as *abjecta*, Hübn.

Although Stephens was certainly in error in quoting *ferruginea*, Esper, as the type of his genus *Rusina*, there is little doubt that his specific description and generic characters were obtained from *umbratica*, Goeze, = *tenebrosa*, Hübn. It is to be regretted, therefore, that *Rusina* has been sunk in *Amathes*, Hübn. (Cat. Phal. vi. 470), and in the present volume *Stygiostola* set up for *umbratica*, Goeze.

Under *Oliga*, Hübner (t. *strigilis*, Clerck), we have *Miana*, Stephens (t. *literosa*, Haworth), and *Photedes*, Lederer (t. *captiuncula*). Other British species included in this genus, besides those usually assigned to *Miana*, are *ophiogramma*, Esp., *scolopacina*, Esp., and *haworthi* (*haworthii*, Curtis).

Crymodes, Guenée (t. *cervina*, Germar, = *maillardi*, Geyer, = *exulis*, Lef.), is merged in *Eremobia*, Stephens (t. *ochroleuca*, Schiff.).

Fissipuncta, Haworth, = *ypsilon*, Schiff., and *zolicoferi* (*zollikoferi*, Freyer), are both referred to *Sidemia*, Staudinger (t. *speciosa*, Bremer). *Testacea*, Schiff., *nickerlii*, Freyer, and *dumerilii*, Duponchel, which, with two other species, Staudinger places under *Apamea*, O.-Treit., are here retained in *Luperina*, Boisduval (t. *dumerili*).

Lithoxylea, Schiff., is the type of *Xylophasia*, Stephens (1829), also of *Septis*, Hübn. (Verz., p. 243), and of *Xylena*, Hübn. (Tent.), but as this species is congeneric with *hepatica*, Linn., which is the type of *Parastichtis*, Hübn. (Verz., p. 212), the latter genus is adopted for the species just mentioned and their allies.

On the fifteen coloured plates are four hundred and eighty figures. In addition to a systematic index at the beginning of the volume, there is a very full alphabetical index (sixteen pages) at the end.

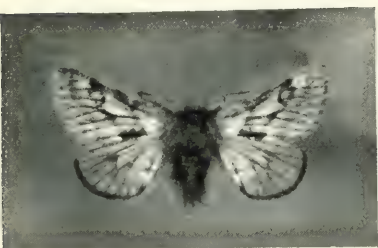
OBITUARY.

EDWIN C. H. DAVIES belonged to that class of working-man naturalist which is so fast dying out with the progress made by so-called Nature Study in our modern educational system. He was born at Porkellis, near Helston, in Cornwall, and had lived for thirty-two years at St. Issey, where he filled the post of rural postman, doing a twelve-mile round daily for the last sixteen years. As a volunteer he became associated with Dr. Griffin, of Padstow, and it is from him and Rev. J. A. Crawshay, his acting vicar for some months, that he appears to have got his taste for natural history. Davies contributed lists of the Ichneumonidæ and Aculeate Hymenoptera to the Victoria History of Cornwall, was interested in Coleoptera, &c., and added botanical records to the 'Flora of Cornwall,' by F. H. Davey, F.L.S., which will shortly be published. He died of consumption on Jan. 12th last, aged thirty-seven years, leaving an aged mother and young married sister. His Hymenopterous collection has passed to Mr. W. A. Rollason, of Truro, who supplies these details.

C. M.



EPICNAPTERA ALICE, *John.*



VARIETIES OF *N. LAPPONARIA*.

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FURTHER VARIATION IN *NYSSIA LAPPONARIA*.

BY E. A. COCKAYNE, M.A., F.E.S., F.L.S.

(PLATE V.)

AMONGST a very large number of males of *Nyssia lapponaria* which I have examined since I wrote my note in the 'Entomologist,' vol. xxxvii. p. 249, the following forms seem worthy of record :—

In 1906 Mr. F. W. J. Jackson bred a very remarkable aberration from eggs which I obtained in the Rannoch district. In the fore wing of this (fig. 1), a very small specimen, the third line is moved inwards so far from the termen that it passes through and obscures the discal spot. The second line is also moved inwards and joins the third about halfway across the wing. The first line is further than usual from the base of the wing, and runs almost parallel to the second, actually touching it at a point a short distance from the costa. Thus all three lines are partially fused, and the large space which usually exists between the first and second line is almost obliterated. Similar aberrations are well known in many other Geometridæ.

Fig. 2 shows a melanic specimen in which the second line, though indistinct, does touch the first, but the third line is in the normal situation.

These two photographs were taken with the same conditions of light and background.

In 1907 I took a male with all the orange replaced by yellow. Specimens with the costa pale yellow and the abdominal stripe speckling orange are not very uncommon. In this, as far as I know a unique male, the costa is almost white, and the thoracic and abdominal stripe pale yellow. I have also one female with yellow instead of orange markings. For this yellow form *lutea* seems to be a suitable name.

This year I have received a specimen (fig. 3) with the black lines more obsolete than in any other I have seen. The discal spot is very distinct, and the costal stripe unusually deep orange.

In the last specimen (fig. 4) there is an almost complete fusion of the second and third lines, and the hind wings are very distinctly marked.

Figs. 3 and 4 are from photographs taken in bright daylight, but not, as figs. 1 and 2, in actual sunlight, and therefore appear less brilliant. All are somewhat enlarged.

FOSSIL INSECTS FROM COLORADO.

By T. D. A. COCKERELL.

CYDNIDÆ (HEMIPTERA).

Cydnopsis handlirschi, sp. nov.

Length, 6 mm.; breadth of thorax, $3\frac{1}{2}$; breadth of scutellum at base just over 2 mm., its length fully $2\frac{1}{3}$; width of head about $1\frac{1}{4}$ mm. Head and thorax densely and rather coarsely granulate; head broad, subtruncate in front, with the median lobe narrow; sides apparently excavated, and angular near the middle, but this is due



Cydnopsis handlirschi.

merely to the faintness of the large eyes, which in reality fill the excavation; sides of thorax broadly rounded; scutellum triangular, longer than broad, the lateral margins straight, the apex obtuse; corium moderately dense, membrane without visible veins; tibial armature not visible; antennæ not preserved.

In Scudder's table of American Fossil Cydnidæ ('Tertiary Insects of North America,' p. 437) this runs to *Cyrtomenus*. It shows much resemblance to *Cyrtomenus concinnus*, Scudd., from the Green River shales of Wyoming, but it differs greatly in the shape of the scutellum (very broad, and oblong rather than triangular in *C. concinnus*), the relatively smaller head, and the more convex profile of the lateral lobes of the thorax. In form and structure *C. handlirschi* is very close to *Pangæus bilineatus*, Say, which lives to-day in Colorado (it occurs at Boulder, and Judge Henderson has obtained it at Fossil Creek), but the *Pangæus* is a smooth shining insect instead of being dull and roughened. In every respect our fossil appears to accord well with *Cydnopsis*, Heer, described from the European Miocene. In several of Heer's species of *Cydnopsis* the sides of the scutellum are dis-

tinely concave in outline, but in one or two they are virtually straight, as in ours. The sculpture of the corium in our insect is practically as in *C. tertiaria*, Heer, but the sides of the thorax in front are more rounded than in that species. In the shape of the head and thorax our insect closely resembles *Neurocoris rotundatus*, Heer.

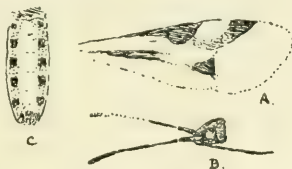
Hab. Eocene shales about six miles north of Rifle, Colorado, sent by Dr. S. M. Bradbury. Found at the same place as *Philorites*, &c.

The species is dedicated to the eminent authority on fossil insects and also on living Hemiptera.

COREIDÆ (HEMIPTERA).

Jadera (?) *interita*, sp. nov.

Length about 6.5 mm.; breadth of abdomen about 1.65, of thorax about 1.75; antennæ 4.3 mm.; hind tibia a little over 3 mm. Head and thorax dark reddish brown; abdomen paler, with submarginal



Jadera (?) *interita*.

A. Hemielytron. B. Head with appendages. C. Abdomen.

quadrate spots, five on each side; antennæ and legs brown; hemielytra with a dark pattern as shown in the figure, but otherwise pallid, the membrane wholly invisible. Rostrum reaching to base of abdomen. Antennæ very slender, with a slender club; approximate length of joints in μ :—(1) 500. (2) 1360. (3) 1200. (4) 1100. Legs slender, the femora somewhat thickened; width of hind femora about middle 425μ , of hind tibiæ at apex 187.

This resembles *Corizus guttatus*, Scudd., from the Green River shales of Wyoming, but in some material from Green River in the Museum of Yale University I have seen what I suppose to be *C. guttatus*, and it is certainly a different insect. The tegmina or hemielytra of *C. guttatus* (type) were not preserved, so it is impossible to say what pattern they may have had. The present insect is hardly a *Corizus*; the last antennal joint is too slender, and the hind tibiæ are too long and slender. *Jadera* (*J. hæmatoloma*, H. Schf.) agrees much better, even having a rather similar elytral pattern, but it is a broader insect than the fossil, with shorter legs.

Hab. Eocene shales about six miles north of Rifle, Colorado, sent by Dr. S. M. Bradbury. Found at the same place as *Eofulgorella*, *Philorites*, &c.

FULGORIDÆ (HEMIPTERA).

Eofulgorella, gen. nov.

A small Fulgorid, with comparatively elongate tegmina, the costa arched basally, but gently concave about the middle; outer margin very oblique. The venation is very well marked by dark lines, the veins being broadly pigmented. The homologies of the different veins in various genera of Fulgoridæ seem to be rather obscure, but as I interpret them in the present case, the venation is as follows: subcosta distinct from radius, ending on costa a little beyond the middle of the, and having one oblique branch to, costa; radius straight, branched terminally as shown in the figure; media branching beyond middle of wing, and enclosing a small fusiform cell; cubitus branching near middle of wing; two cross-nervures from cubitus to media, and two from cubitus to first anal, the latter before middle of wing; series of gradate veins in the subapical field very well marked, consisting of a series of oblique transverse veins, one following the other, between the longitudinal nervures.

I failed to associate this with any living or fossil genus, and so sent a sketch to Mr. E. P. Van Duzee, who kindly replied that it agreed with nothing known to him. It has a general resemblance to *Oliarus* and its allies, but is remarkable for the shape of the tegmen and the regularity of the gradate veins.

Eofulgorella bradburyi, sp. nov.

Tegmen about 8 mm. long and $2\frac{1}{2}$ broad; with dark veins, and the apex broadly infuscated. No other parts preserved.

*Eofulgorella bradburyi*.

S.C. = Subcosta. R. = Radius. M. = Media. Cu. = Cubitus. A. = First Anal.

Hab. Eocene shales about six miles north of Rifle, Colorado; received from Dr. S. M. Bradbury. The locality is the same as that from which *Philorites* and other Diptera have been described.

AGRIONIDÆ (ODONATA).

Enallagma mortuella, sp. nov.

Head and thorax black; abdomen, at least as far as middle, warm red-brown above, pallid at sides, a ventral band and the sutures darker brown, no sign of any black saddles on the distal ends of the segments, such as are usually seen in modern species. Legs pale reddish, the femora at least largely black, the tibiæ with short black bristles, quite as in the living species. Wings clear, the veins black or almost; stigmata warm red-brown with heavy black margins, alike on upper and lower wings. Length of anterior wings 19 mm., nodus to centre of stigma 11 mm.; length of posterior wings $17\frac{1}{2}$ mm.; eleven postnodal cross-veins in anterior and nine in posterior wings.

Upper side of quadrangle longer than inner; upper and lower sides of stigma subequal; base of subquadrangle (hind wing) nearly (a small fraction basad) even with the midmost point between antenodal cross-veins*; anterior cross-veins far apart, the cell they bound being over four times as long as deep, much as in the living *E. signatum* and *fischeri*; Cu_2 having its origin and course entirely as in *Enallagma* (consequently not as in *Telagrion*).

This will not go in either of Kellicott's divisions ('Odonata of Ohio,' p. 32), since both bands and spots referred to are wholly absent. So far as the colour of the abdomen goes, the species should be placed in *Amphiagrion*, but the generic characters of the tenth abdominal segment remain unknown. I cannot see any postocular spots or band, but am not quite positive that these were absent. The size agrees better with *Enallagma* than *Amphiagrion*.

Regarded as an *Enallagma*, the fossil would come nearest, by its coloration, to the little group of *E. signatum*, *fischeri*, and *pollutum*, and it is noteworthy that it also falls here by the shape of the cell bounded by the antenodal cross-veins. (*E. civile*, *hageni*, and *carunculatum* have this cell much shorter.)

The cells between the quadrangle and the level of the nodus are four in the anterior and three in the posterior wings; there are four cells between M_1 and M_2 before the doubling begins; the poststigmatal cells are four in the upper and three in the lower wings. The subnodus is very oblique. The brace-vein is distinct, and M_1 is conspicuously angled thereat. The lower side of the stigma is broad, bordering a trifle more than one cell; in most of the modern species it borders conspicuously less than one cell, but in the anterior wings of a female taken by Mr. G. L. Garlick at San Geronimo, New Mexico, belonging either to *E. annexum* or *calverti*, the stigma is as in the fossil. No doubt the longer stigma is a primitive character.

In my table in Amer. Journ. Sci., July, 1908, pp. 71-72, this runs to *Agrion mascescens*, Scudder, but it is smaller than that species, and differs in the position of the base of the subquadrangle. The difference in size can hardly be sexual, as the type of *mascescens* was a male. There is no doubt that it is very close to *mascescens*, and it may be that the difference is due to variation, but it seems preferable to treat it as distinct. The abdomen of *mascescens* is described as colourless.

Hab. Miocene shales of Florissant, Station 13 B, 1908 (George N. Rohwer).

BIBIONIDÆ (DIPTERA).

Bibio atavus, sp. nov.

♀. Length about 10 mm.; wings $8\frac{1}{2}$; head, thorax, and legs black, the dorsum of thorax browner; abdomen dusky ferruginous.

* In Amer. Journ. Sci., July, 1908, p. 72, there is a short table relating to this character, but by some unfortunate accident "quadrangle" is printed in place of subquadrangle.

Wings mainly clear, but with the costal region broadly fuliginous, this narrowing toward the apex, but including the whole of the third vein; veins thick, dark reddish-brown. In venation this agrees with *Bibio* as figured by Williston (N. A. Dipt. p. 142, f. 4), except that the basal section of the third vein (from anterior cross-vein to first vein) is shorter, and the cross-vein between the fourth and fifth is a trifle longer. The hind femora are slender, and only about 2 mm. long.

The male, as in modern species, has swollen anterior femora. In this sex the dark colour of the wings appears to be redder and more suffused.

This is a perfectly typical *Bibio*, such as may be caught in Colorado to-day, even to the structure of the anterior legs in the male.

Hab. Miocene shales of Florissant, very abundant. The Bibionidæ from earlier American Tertiaries belong to the less specialized genus *Plecia*. I learn from Prof. Melander that a yellowish *Plecia* was collected in the Florissant shales by Scudder.

Bibio dubius, Bellardi, is later than the fossil *B. dubius* (Germar) Giebel, but as the latter was originally described (in 1837) under *Phthiria*, and is doubtfully a *Bibio*, the name of the Mexican species can probably remain.

Bibio gracilis, Walker, List Dipt. Brit. Mus. 1848, p. 123 (Canada and N. H.) is a homonym of *B. gracilis*, Unger, 1841. Walker's species may be called *Bibio slossonæ*, n. n., having been added to the United States fauna by Mrs. A. T. Slosson.

ON TWO UNDESCRIBED SPECIES OF *SCOLIIDÆ* FROM BORNEO.

BY P. CAMERON.

Discolia ornaticollis, sp. nov.

Black, the prothorax and scutellum rufous, the pro- and mesonotum covered with stiff, depressed, red hair; the scutellum and base of metanotum more sparsely with longer paler reddish hair, the hair on the head, pleuræ, apex of metanotum, abdomen, and legs white; the clypeus, except for a large black mark on the apical half and the mandibles, except at the apex, pale yellow. Abdomen distinctly bluish violaceous. Wings uniformly fuscous violaceous, the nervures black. ♂. Length, 8 mm.

Kuching, Borneo (John Hewitt, B.A.).

Front and vertex smooth; the metanotum in the centre strongly but not closely punctured; the sides are neither so strongly nor so closely punctured. Except for a black spot on the sides near the apex the prothorax is red. Apical abscissa of radius broadly roundly curved.

A distinct little species.

Tiphia punctifrons, sp. nov.

Black, the antennæ, tegulæ, four anterior legs, except the coxæ and the mandibles, except at the base and apex, red; wings hyaline, the stigma large, black, the costa and nervures testaceous; metanotum with three keels, and one on the basal half between the outer and central. Front strongly punctured, the punctures clearly separated; the face and clypeus opaque, more closely and finely punctured. Basal abscissa of radius roundly, broadly curved, longer than the second; the second recurrent nervure interstitial, the first received distinctly beyond the middle of the cellule. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

Sides of front punctured, but not so strongly as the apex; the centre above and the vertex smooth; the temples punctured. There is a crenulated border on the base of the mesonotum behind the keel; the rest of it and the scutellum smooth, except for some scattered punctures. The upper part of the propleuræ at the base narrowly, the lower broadly longitudinally striated. Mesopleuræ with scattered punctures. Metapleuræ longitudinally distinctly aciculated, the apical half from shortly behind the middle longitudinally striated. Apical half of abdomen opaque, densely covered with fuscous pubescence. Apex of clypeus slightly incised.

Allied to *T. borneana*, Cam., which may be known by the black four anterior femora, black alar nervures, longer first abscissa of radius, the second recurrent nervure not interstitial, &c. For a synopsis of the Bornean species of *Tiphia*, see my paper in the 'Entomologist,' 1907, pp. 288-289.

DESCRIPTION OF A NEW LASIOCAMPID MOTH FROM TURKESTAN.

By OSCAR JOHN (St. Petersburg, Russia).

(PLATE V.)

Epicnaptera alicæ, nov. sp.

Male. Head, collar, patagia and thorax thickly and evenly covered with woolly, mouse-coloured hair. Palpi bushy, of a darker hue, forming together with the hair of the frons a muzzle-like prominence. Antennæ pectinate, yellowish brown. Abdomen dorsally in its proximal part haired as the thorax, distally, on the sides and on the under side covered with short ochreous hair. Legs mouse-grey, woolly-haired. Wings of the typical form, external margin even, hind wings undulated near apex only. General colour of fore wings same as of thorax, with a brownish tinge in the middle area. The pattern is much the same as in the other species of the genus, the inner and elbowed lines consisting of dark-brown dots. Stigma in cell distinct, dark brown. The pale subterminal line suffused, running straight from costal to inner margin and bordered outwardly with a dark shade. Hind wings of the same ground

colour, paler in the inner portion of the basal area and showing a pale suffused triangle extending from apex to anal angle, on which latter it rests with its base. Under side of fore wings coloured as the upper side in its outer area and yellowish-grey in the middle and basal areas. Transverse lines more or less distinct. Hind wings with their upper basal half dark, bordered by a curved dark-brown stripe or throughout of a dark-brown coloration; outer half as on the upper side, anal portion pale grey. Length of fore wing $12\frac{1}{2}$ to 13 mm.

Three male specimens were captured by Mr. S. Malysheff near Baigacum, Syr-Darja, on April 17th, 20th and 21st, 1908. Two specimens are in my collection, and the third one was destroyed for dissecting purposes. Female unknown.

There is no doubt of this species being quite distinct from all others of the genus *Epicnaptera*, Rbr. known from the Palæ-arctic region, i.e. *ilicifolia*, L., *arborea*, Blöcker,* *tremulifolia*, Hb., *suberifolia*, Dup. and *glasunovi*, Gr. Gr. The fittest place in the system for this new species, which is the most divergent, would be after *glasunovi*, with which it has the almost even margin of the wings in common. *E. alice* differs from *glasunovi* not only in size, being considerably smaller, but also in coloration (*E. glasunovi* is orange-yellow).

I dedicate this new species to Miss Alice Tottien, of St. Petersburg.

DRAGONFLIES IN 1908.

By W. J. LUCAS, B.A., F.E.S.

DURING the season of 1908 very little of fresh interest was noted in connection with the British dragonflies. The season seemed late in commencing, the first dragonflies seen by myself being on May 17th. On that date I met with *Pyrhosoma nymphula* at the Black Pond on Esher Common, Surrey, where also I saw a specimen of *Libellula quadrimaculata* hanging to its nymph-skin, at the time too weak apparently for flight. On May 24th at the same place *P. nymphula* and *Enallagma cyathigerum* were fairly numerous, and I captured a male *Cordulia ænea* in the same neighbourhood. Three days later I received from H. Hart a female *Libellula depressa* taken in a garden in the outskirts of Kingston-on-Thames. On the last day of the month a female *Pyrhosoma tenellum* was captured at the Black Pond, this being an early date, for my previous earliest record seems to be June 9th.†

In the New Forest from June 9th to June 16th there were noticed at least:—*Agrion mercuriale*, both sexes; *P. nymphula* and *Calopteryx virgo*, numerous, and *L. depressa*, fairly so; *Orthe-*

* H. Blöcker, 'Revue Russe d'Entomologie,' viii. No. 2, 1908, p. 126.

† Mr. E. J. Hare took the species a day earlier, on the occasion of the excursion of the South Lond. Nat. Hist. and Ent. Soc. to Oxshott, May 30th, 1908.

trum cærulescens, very numerous, but seldom very blue in colour. *A. mercuriale* was in yet another new locality—near Holmsley. Search was made for *Gomphus vulgatissimus* in its known locality along one of the streams in the southern part of the Forest, without success: it was probably but just emerging, or there may not have been sufficient sun for it. Two empty nymphskins were found, however, on the bank of another perfectly distinct stream, also in the south of the Forest.

On June 8th in the New Forest *O. cærulescens* and *P. nymphula* were found held in captivity by *Drosera intermedia*, one of the Sundews. Insects of this size are usually caught by the wings which become useless when smeared with the tenacious gum from the tentacles. These dragonflies were alive and could not, I suppose, have been employed as food by the plant, unless the tip of the abdomen or some other nutritious part had been near enough to the tentacles to be secured and attacked. No doubt such captured dragonflies would soon die of starvation. On August 19th, also in the Forest, an *O. cærulescens* was caught by the tip of a wing, but so tenacious was the gum that it had to struggle to escape.

During a week-end visit to Bedford (July 10th to July 12th) *Agrion puella* was found between Bromham and Kempston, and near Milton Ernest; while in the second locality *Ischnura elegans* was secured also.

On June 14th I received from H. Towell a living male of *Æschna cyanea* taken in Teddington, Middlesex. It was teneral in condition, but is worthy of note on account of the date, as even July 1st would be considered quite early for the species. It was captured indoors and was probably bred in the water of an old gravel pit close at hand. A specimen was taken on July 24th near Albury on the North Downs in Surrey. On September 9th I watched a male settle on the hedge-side at Shotover Hill, Oxon. The weather was so poor that the insect allowed me to approach and without any difficulty to take it with my fingers. Mr. N. P. Fenwick, Jr., took one on October 18th near Esher Common, this being the last of which I heard—more than four months after the first. On July 25th H. Hart shewed me a female *Æschna grandis* taken in the Cemetery, Kingston-on-Thames.

In the New Forest, from August 1st to September 4th, the species noted were:—*Cordulegaster annulatus*, *O. cærulescens*, *C. virgo*, *P. tenellum*, *Platynemis pennipes*, *A. mercuriale*, *Sympetrum scoticum*, *Lestes sponsa*, *I. elegans*, *L. quadrimaculata*, *Sympetrum striolatum*, *Æschna mixta*, *Æ. cyanea*, and *E. cyathigerum*.

In the autumn Esher Common and the Black Pond within its boundaries were several times visited with the following results:—September 5th, a poor day, *S. scoticum* common, *S. striolatum* a few, *E. cyathigerum* several, *P. tenellum* a few, also a few *Æschnæ*; October 4th, there were seen *P. tenellum*

one female, *E. cyathigerum* one male and one female, *S. striolatum* and *S. scoticum* very common, also an *Æschna* or two; October 11th, *E. cyathigerum* one male, *S. scoticum* very common, *S. striolatum*; October 18th, *S. striolatum* common, *S. scoticum* very common.

As regards late occurrences Mr. F. W. Champion tells me of the capture of a male *L. depressa* on September 7th at Chingford in Essex, and I took a male *L. quadrimaculata* on August 7th near Beaulieu River in the New Forest. My last dragonfly experience for the season was on November 1st when several *S. striolatum* were seen in the New Forest.

ON THE TRIMORPHISM OF *PYRRHOSOMA NYMPHULA* (FEMALE).

By F. W. & H. CAMPION.

Two important variations from the normal decoration of *P. nymphula* (female) have been known to entomologists for many years, and at one time each form was accorded separate specific rank. In one of them (var. *fulvipes*) the black markings on the abdomen are greatly reduced in extent, and in the other (var. *melanotum*) they cover practically the whole of the dorsal surface.

Var. *fulvipes* (Steph.).

Agrion fulvipes is thus described by Stephens:—

“Sp. 11. *fulvipes*. *Sanguineum, nigro-æneo pictum, pedibus rufis*. (Long. corp. 17 lin.; Exp. Alar. 24 lin.)

“Ag. *fulvipes*. Steph. *Nomen*. 2d edit. col. 113.

“Head brassy, front red, with two black streaks; thorax brassy above, with a slightly interrupted yellowish-red streak on each side, the sides themselves and beneath reddish-yellow, with brassy sutures; abdomen blood-red, the five basal segments each with two transverse brassy streaks at the apex, the remainder brassy above, with the sides and apex red; legs tawny-red; wings hyaline, stigma pale red. Sometimes all but the two basal segments of the abdomen are brassy above.

“Taken at Coombe wood, and near Ripley, in June.”—Ill. Brit. Ent. vi. Mand. p. 75 (1836).

A practical interpretation of this description is afforded by a very immature female of *P. nymphula* contained in the Stephens Cabinet in the British Museum (Natural History); attached to it is the printed name “*fulvipes* Steph.,” and the well-known small oval ticket which distinguishes Stephens's own specimens.

Fulvipes varies a little in detail, but it may be separated from the normal female by the reduced markings on segments two, three, and four. On two the mid-dorsal black line is very weak, and the apical crown-shaped spot is replaced by a wide

bifurcation of the median line, but there is no connection with the circlet at the apical suture. Segments three and four are often similar to number two, but when, as sometimes happens, the median line is continued through the bifurcation to the circlet, an anchor-shaped spot is produced, the stock of the anchor being represented by the circlet. Segments one and five to ten appear to be normal and constant.

The legs of Stephens's specimen are, as stated in the description, tawny-red, and so are the legs of a more mature example of the same form taken at Folkestone by Mr. O. Thomas on May 15th, 1892, also in the Museum; but in all the other specimens which we have seen the legs are black, as in the teneral and adult states of normal males and females.

This form is quite common. An example from Folkestone has been already mentioned, as well as two Surrey localities given by Stephens. Mr. W. J. Lucas has shown us a specimen bred from a Surrey nymph in May, 1900, and another taken on Esher Common on June 10th of the same year. We have the form from Epping Forest (June 16th, 1907; June 14th, 1908; and May 9th, 16th, and 30th, 1909). The British Museum possesses a specimen from De Selys' Collection, and another from Germany presented by Mr. W. F. Kirby, and collected during July, 1887.

Var. *melanotum* (De Selys).

This uncommon form has been excellently figured by Mr. W. J. Lucas (Entom. 1901, pl. i. fig. 3), and more recently Mr. K. J. Morton has restored to it its Selysian name, which had been overlooked (*ibid.* 1908, p. 38). We observe from Mr. Lucas's paper on the Dale Collection (Ent. Mo. Mag. 1909, p. 82) that that collection contains at least one specimen of *melanotum*. Another example is in the Stephens Cabinet; it carries the usual oval ticket, and a printed label reading "*Lincolniense Step.*" It is probable that De Selys saw this insect when he consulted the Stephens Cabinet in 1845, for the following entry appears in the synonymy of *Agrion minium* given in his 'Revision of the British Libellulidæ,' published in the following year:—"A. *lincolniense*, Steph. Catal. and Ill. (partim: the young female)." The courtesy of Mr. Lucas has enabled us to compare with Stephens's specimen an example of *æneatum* taken in the New Forest on June 5th, 1900, with the result that the comparison has established complete agreement.

Agrion lincolniensis is set out in Stephens's 'Catalogue' as a separate species, thus: "3418. 9, *Lincolniensis*. Dale MSS." As no description is given, of course the bare name cannot stand. Afterwards, in his 'Illustrations,' Stephens wrongly identified this distinct insect with *Agrion chloridion* (Charp.), and sunk the name *lincolniense* as a synonym of that species. But it is clear that the dragonfly to which Charpentier gave the name *chloridion*

was, in both its sexes, *Erythromma naidas* (Hansem.). Indeed, when describing *melanotum*, De Selys perceived the danger of that form being confused with immature *E. naidas* (female), and drew particular attention to the characters by which the two females were to be distinguished.

Stephens's confusion was perpetuated by Evans, and the figure of *Erythromma chloridion* (female) given in 'British Libellulinae' (pl. 5, fig. 6), and stated to have been taken from a specimen in Stephens's Cabinet, may be regarded as representing, though very inadequately, the particular insect still in the collection.

It appears, therefore, that the synonymy of the variety stands thus:—

Agrion lincolniensis, Stephens, Syst. Cat. Brit. Ins. i. p. 307, no. 3418 (1829).

Erythromma chloridion, Evans, Brit. Lib. p. 16, pl. 5, fig. 6 (1845).

Pyrrosoma minium var. female *melanotum*, De Selys, Bull. Acad. Belg. (2), xli. p. 1298 (1876).

Pyrrosoma nymphula var. female *æneatum*, Lucas, Entom. xxxiv. p. 68, pl. 1, fig. 3 (1901).

Lincolnshire must now be added to the other known English localities, viz. Dorset and the New Forest. Extra-British localities which have been given are Madrid and the Sierra Albarracin, in Spain, and Corfu.

33, Maude Terrace, Walthamstow : June 1st, 1909.

DESCRIPTIONS OF FOUR NEW SPECIES OF *POMPILIDÆ* FROM SARAWAK, BORNEO.

By P. CAMERON.

Pompilus lissonotus, sp. nov.

Black, very smooth and shining, primrose; the antennal scape, basal half of the flagellum and the under side of the fore femora dark rufo-testaceous, the palpi, more than the basal third of the hind tibiæ behind, and the spurs, white; wings hyaline, smoky from the base of the radius to the apex; the nervures black; the second cubital cellule oblique, of equal width; the first abscissa of the radius is almost double the length of the second, which is about one-fourth longer than the third; the first recurrent nervure is received near the base, the second at the base of the apical third of the cellule. The accessory nervure in the hind wings is received considerably in front of the cubitus. Calcaria white, the long spur of the hinder reaching close to the apex of the metatarsus. ♂. Length, 4 mm.

Kuching, Borneo, January (John Hewitt, B.A.).

Antennæ short and thick, covered with a short pile; the pedicel longer than wide, the third joint a little shorter than the following.

Eyes converging below; the hinder ocelli separated from each other by a distinctly less distance than they are from the eyes. Temples almost obsolete, the occiput transverse. Apex of clypeus transverse, with the sides oblique. Pronotum longer than mesonotum. The tibial spines are few in number; the tarsal are more numerous and shorter. Abdomen sessile, as long as the thorax.

Pompilus properans, sp. nov.

Black, the calcaria white; densely covered with silvery pile; wings hyaline, a triangular cloud along the transverse basal and transverse median nervures, the narrowed end above and the lower wider on the outer than on the inner side; a cloud filling entirely the radial cellule, the second and third cubital cellules and the space behind the first transverse cubital and beyond the third, the clouds at these obliquely narrowed in front, the apical part more irregularly than the basal; the cloud extends into the discoidal cellule along the second recurrent nervure, more widely behind than in front; the second abscissa of radius one-third longer than the third; the recurrent nervures received near the base of the apical fourth of the cellules; the accessory nervure in hind wings received distinctly behind the cubitus. The long spur of the hind tibiæ extends beyond the middle of metatarsus. Claws bifid, the inner claw thicker than the outer. ♀. Length, 6 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head distinctly wider than the thorax; the temples short; eyes converging above; the hind ocelli separated from each other by a very slightly greater distance than they are from the eyes. Tibial and tarsal spines longish.

Pompilus parvispinosus, sp. nov.

Black, smooth, shining, covered with a white primrose pile, the basal three abdominal segments red, the extreme base of the first, an indistinct transverse line shortly beyond the middle of the second, and a distinct one across the middle of the third, black; the apices of the fourth and fifth segments dark rufous; the palpi, mandibles except the teeth, the apex of the anterior coxæ below and the whole under side of the four posterior, the under side of the four anterior trochanters, and the apex of the posterior whitish-yellow; wings fuscous-violaceous, the posterior pair paler than the anterior, the nervures black; the second abscissa of the radius about one-third longer than the third, which is as long as the fourth; the first recurrent nervure is received shortly beyond the middle, the second at the apex of the basal fourth of the cellule; the accessory nervure in the hind wings is received shortly beyond the cubitus. Eyes converging above, separated there by the length of the third antennal joint. Hinder ocelli separated from the eyes by almost double the distance they are from each other. Apex of clypeus transverse, the sides obliquely narrowed. There is a narrow keel down the middle of the face. Temples almost obsolete, the occiput transverse. ♀. Length, 13 mm.

Matang, Sarawak, Borneo, December (John Hewitt, B.A.).

The apex of the anterior femora narrowly, of the intermediate more broadly, almost the apical three-fourths of the posterior except below, the four anterior tibiae, except below, the basal three-fourths of the posterior above, and the greater part of the four anterior tarsi, yellowish-white; the spurs black, the longer of the posterior almost half the length of the metatarsus. The tarsal and tibial spines are numerous, black, and much shorter than usual. Scutellum flat. Base of mesonotum broadly rounded.

Salnis (Myngynia) hirticandis, sp. nov.

Black, the head above and below, the prosternum, fore coxæ, and ventral surface of abdomen covered with long black hair; the apical two abdominal segments densely with shorter fuscous pubescence, which becomes much paler towards the apex; wings dark fuscous, intersected with lighter spots; the apex with a fuscous hyaline border beyond the nervures; the third abscissa of the radius about one-fourth longer than the second; the second transverse cubital nervure is curved and angled at its junction with the recurrent; the third is irregularly, roundly curved outwardly; the second recurrent nervure is received shortly beyond the apex of the basal third of the cellule. Eyes slightly converging above, separated there by the length of the third antennal joint. Apex of labrum slightly, roundly incised in the middle, the sides at the incision roundly oblique. Apical joints of palpi fuscous. The tibial and tarsal spines stout. The long spur of the hind tibiae extends shortly beyond the middle of the metatarsus. ♂. Length, 37 mm.

Kuching, Borneo, May (John Hewitt, B.A.).

The basal tooth on the claws is shorter and blunter than the apical. Temples short, broadly rounded. Hinder ocelli separated from each other by almost the same distance as they are from eyes. Antennæ stout, tapering towards the apex, the joints not clearly separated; the third not one-quarter longer than the fourth.

NOTES AND OBSERVATIONS.

DEFERRED EMERGENCE OF EUPITHECIA TOGATA.—Although many species of Lepidoptera belonging to most diverse families are known in certain seasons, or even habitually, to pass more than one year in the pupal state, I am not aware whether this habit has before been noticed in the case of the "pugs." The following note may therefore be of interest:—In the winter of 1907, in response to an advertisement in this Journal, I purchased from a collector in Perth one dozen pupæ of the above species. The cocoons were placed in a breeding-cage kept in a lavatory in the house, and in 1908 nine imagos emerged on the following dates:—Two on May 24th, one on the 25th, two on the 27th, two on the 28th, one on the 29th, and one on the 30th. As no more emerged, I concluded that there had been a death-rate of 25 per cent. On clearing out the cage preparatory to a journey to Scotland last autumn (1908), I noticed that one of the pupæ, as seen through the partially opened cocoon, did not appear to be dead, so this and

all the others were returned to the cage, which was taken in August to Scotland, in September to Lyme Regis, and was brought back to London in October. No *Eupithecia* larvæ were taken by me last season. On May 9th of this year a very fine specimen of *E. togata* emerged and another, equally fine, on May 16th, two out of twelve having thus spent two years in the pupal stage. Whether the twelfth is dead or is deferring its emergence till 1910 remains to be seen. I do not know whether this is the usual habit of the species, or whether it is exceptional. The breeding-cage was kept indoors, and certainly would have been at a higher average winter temperature inside a house in London than the pupæ would have experienced in the pine-woods of their native home in Scotland, so the deferred emergence cannot be ascribed to refrigeration. — R. MELDOLA; 6, Brunswick Square, W.C., June 3rd, 1909.

THE "LARGE COPPER" BUTTERFLY (*CHRYSOPHANUS DISPAR*).—As no accepted record exists of the occurrence of this species in Britain since 1848, I do not think I can be accused of acting in an unscientific manner by trying to re-introduce it through Continental specimens. I have, consequently (through the kindly help of Mr. J. W. Tutt), turned out a number of the larvæ of the "*rutilus*" form at Wicken Fen, and I ask the support of all entomologists to preserve specimens from capture for some years to come, in order to see if this beautiful species can be re-established. It will also be interesting to see if in the course of a few generations any reversion to the British form "*dispar*" might occur. I hear that an attempt is also being made to introduce the other "*dispar*" (*Lymantria*) at the same place, so British (?) records of this will also be valueless.—G. H. VERRALL; Sussex Lodge, Newmarket.

THE BRITISH RAPHIDIIDÆ.—Referring to Mr. Claude Morley's notes on the British species of *Raphidia* (Entom. June, 1909, pp. 141-3), I may say that *xanthostigma* is distinctly the commonest species of the genus in Yorkshire, and cannot in any way be called rare. In my own experience it is not at all uncommon in the Wharnccliffe Woods, near Sheffield; and in the Wheatley Woods, Doncaster, one can almost always rely on beating it out any suitable day at the end of May, or early in June. I have specimens, too, taken in different years at Skipwith, near Selby, by the Rev. C. D. Ash. Outside our county, Mr. G. W. Mason has sent it to me from Wrawby Moor, Lincolnshire; and I have taken it in Chippenham Fen, Cambridgeshire. Of *notata* I have four fine specimens, all taken on the same day in Bishop's Wood, near Selby, its other recorded Yorkshire localities being York (R. McLachlan), and Haw Park, Wakefield. Outside our county I have taken it in the New Forest. Miss Alderson has sent me specimens from Sherwood Forest, Notts, where she finds it not uncommonly, and I have several from Gosfield in Essex, taken by the late Mr. Alfred Beaumont. Neither *cognata* nor *maculicollis* are as yet recorded for Yorkshire, but the latter has for so many years been known to occur in abundance in the Oxshott (Surrey) district, that it was a surprise to read that Mr. Morley regarded it as "apparently confined to the New Forest." —GEO. T. PORRITT; Elm Lea, Huddersfield, June 12th, 1909.

THE RHOPALOCERA OF JAVA.—Publication of the first of a series of illustrated monographs on Java butterflies has been recently announced. It treats of the Pieridæ, and is by M. C. Piepers and P. C. Snellen, with the collaboration of H. Fruhstorfer. The publisher is Martinus Nijhoff, The Hague, Holland.

NOTES ON THE LIFE-HISTORY OF CAPYS DISJUNCTUS. — Some years ago Mr. A. D. Millar, of Durban, Natal, discovered the above-named butterfly which has, I believe, since been described, although it does not appear in Mr. R. Trimen's book on the 'Butterflies of South Africa.' The egg is laid upon the outside of the pod of the plant *Protea hirta*. The young larva, which is nearly black in colour, after leaving the egg-shell, immediately bores into the pod, which is then green and soft, feeding and making a tunnel in a downward direction. There is not very much change in the colour of the larva, but as it increases in size it gradually becomes lighter. When full-grown it is about one inch in length, very fat, slug-like in shape, and very much resembles *Cossus ligniperda* in colour when about half-grown. Having made a hole for the escape of the imago it changes into a brown pupa inside the pod. Like many of the Lycænidæ, both the larva and pupa are nearly always found accompanied by small brown ants which do not in any way injure either. The butterfly emerges about ten to fourteen days after the change to the pupal state. The plant grows upon the sides and tops of hills about one thousand feet above sea-level at Pinetown, Natal, some ten miles from Durban, and I have no doubt at other places as well. Those plants growing near the top of the hills are most favoured by the butterfly, and very few larvæ were found in the pods near the base of the hills. The pods vary very much in size, and as the larva does not leave the one it first enters to go into another, this accounts for the great difference there is in the size of the perfect insect; the large pods producing fine large insects, and the small ones just the reverse, in fact, some of the former are double the size of the latter. I never found more than one larva in a pod, and by the time the larva is full-fed the part of the pod it is then feeding upon is as hard almost as any wood. When I first found these larvæ I opened several of the pods, took out the larvæ which I thought were going to pupate and put them in a chip box to do so. The following day I was very much surprised to find, first that the ants had found them out and got into the chip box (where they came from, I don't know), and secondly, that out of ten larvæ only four remained—the other six had bored through the box. The fugitives I found near the top of the wall of the room in which I rear caterpillars, and the ants up there with them. In spite of feeding in pods the larvæ are still ichneumonated, and I have bred a good number of these parasitic flies. I found in all about thirty larvæ, and in March last reared about twenty-four specimens; the remainder of the larvæ were ichneumonated.—J. F. LEIGH, F.E.S.; Durban, Natal, May 1st, 1909.

SHORT DURATION OF EGG-STAGE OF *A. ULMATA*.—On Tuesday, June 15th, I took *A. ulmata* plentifully. A female began laying ova in a glass-bottomed box late in the afternoon and during the evening.

I was, however, somewhat surprised to find on the following Monday morning that the greater number had hatched out. This certainly seemed a very short time for duration of the egg-stage—five and a half days.—(Rev.) J. E. TARBAT; Fareham, Hants, June 24th, 1909.

OCCURRENCE OF *P. MONETA*.—For the last eight years I have looked out plants of *Delphinium* in this neighbourhood for traces of the larvæ of *P. moneta* without success. This month, however, I have found or had brought to me sixteen cocoons, so that the species is evidently still extending its range. It has been taken in the county for some years, but to my own knowledge not so far west.—(Rev.) J. E. TARBAT; Fareham, Hants, June 24th, 1909.

[This species has been recorded from the New Forest.—ED.]

THE ENTOMOLOGICAL CLUB.—A meeting was held at the Savage Club, Adelphi Terrace, on May 20th last, Mr. H. Rowland-Brown in the chair. Other members present were Prof. E. B. Poulton and Messrs. R. Adkin, T. W. Hall, G. T. Porritt. Among other visitors were the Honorary Members, Messrs. A. H. Jones and A. Sich.—R. SOUTH, Hon. Sec.

ERRATA.—Page 140, line 6, for "Crosley" read "Crosby"; line 23, for "pine or among sweet gale" read "June 1907, among sweet gale"; line 15 from bottom, for "*Graphiolitha*" read "*Grapholitha*." Page 141, line 1, for "*bilunaria*" read "*bilunana*."

CAPTURES AND FIELD REPORTS.

EURYMENE DOLABRARIA IN CUMBERLAND.—As there have been few records of this moth in the North of England, it may perhaps be of interest to record that I captured a specimen on the wing, on June 3rd, at Tarn Lodge.—GEORGE B. ROUTLEDGE; Tarn Lodge, Headsnook, Carlisle, June 4th, 1909.

GONODONTIS (ODONTOPERA) BIDENTATA AB. NIGRA IN SURREY.—I have to record the capture, by myself, of a male *G. ab. nigra* (Prout) on May 31st, 1909. The specimen was at rest on the tarred fence surrounding Waverly Woods, Surrey. Is not this a record for Surrey? I have never heard of it being taken so far south. I see that Yorkshire and Lancashire are given as localities in 'Moths of the British Isles,' series ii., p. 278.—CECIL WORSSAM; Hillside, St. Albans.

ARGYROLEPIA SCHREIBERSIANA IN CAMBRIDGESHIRE. — On June 3rd last I went into Cambridgeshire to look for some *A. schreibersiana*, but it was a very cold day, wind north-east, and I did not expect to do much good. After examining a great many trunks of elm, I was successful in taking two specimens, and was about to return home, when I came to a small whitethorn bush, which I beat for larvæ. To my great surprise and pleasure I found three *A. schreibersiana* at the first beating, and was successful in taking eighteen in all. The cold had evidently driven them into the bush for shelter. I think this is a record catch of this rare and pretty little Tortrix for one

day.—ROBT. S. SMITH, JUNR.: The Laurels, Downham Market, Norfolk.

PALIMPSESTIS (CYMATOPHORA) OCTOGESIMA IN LONDON DISTRICT.—On July 11th, 1907, and again this year, June 13th, I had the pleasure of capturing this moth here; both specimens were taken at sugar, not on poplar trees.—M. F. BLISS; Coningsburgh, Ealing, W.

CELASTRINA (CYANIRIS) ARGIOLUS IN MIDDLESEX.—I am glad to say that after an absence of six years *C. argiolus* has turned up again in our garden during the second fortnight of May, flying around the flowering holly-trees in some numbers. It appears also to have been generally common in this part of Middlesex, and I have seen several in the gardens of Woodridings, Pinner, and Eastcote, while just over the border, at Eastbury, in Oxhey Woods, it was appearing singly among the wild hyacinths on the 22nd. I may add that I have never seen an example of the autumn generation here, though we have plenty of flowering ivy. The common butterflies, *P. brassicae*, *P. rapae*, and *C. pamphilus* have never been so abundant in my recollection.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, June 20th, 1909.

PANCHLORA NIVEA, L.—A specimen of this pretty cockroach was brought, in the beginning of this month, from Jamaica to Cupar, among bananas. It was exceedingly lively when I got it. One could not but admire how closely it was adapted to its environment. A little less than the "blackbeetle" of our kitchens, it was hardly thicker than a playing-card, of a pale green, with transparent tegmina of a lighter shade. It would be seen with difficulty in the crevices of the plant. The specimen has been identified by Mr. Grimshaw, of the Royal Scottish Museum, Edinburgh, where it is placed for preservation.—HENRY H. BROWN; Cupar Fife, June 19th, 1909.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 5th, 1909.*—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. S. A. Neave exhibited three specimens of a remarkable Cæstrid fly belonging to the genus *Spathicera*, Corti, captured on the carcase of a rhinoceros shot by him near Fort Jameson, N.E. Rhodesia, in February, 1908. He pointed out the extreme rarity of individuals of this genus in the imago state, though Cæstrid larvæ had long been known and frequently recorded in the intestinal canal of *Rhinoceros bicornis*, and recently Prof. Sjöstedt had succeeded in rearing one individual from a larva, described by him under the name *Meruensis*. This seemed also to be the first recorded occasion on which the adult insect had actually been observed to be following the rhinoceros, and it was of some interest in this connection that both sexes were represented (two males, one female).—Mr. H. St. J. Donisthorpe brought for exhibition examples of *Formica exsecta*, Nyl., from Parkhurst Forest, Isle of Wight, and from the same locality *Dinarda hagensi*, Wasm., hitherto only observed (with the same ant) in Britain at Bournemouth by the

exhibitor; also *Tetramoferia donisthorpei*, Kieffer, n. sp., and *T. femoralis*, Kieffer, n. sp., taken by himself with *Tetramorium cæspitum*, L., at Whitsand Bay, Cornwall; *Paracletes cimiciformis*, taken with *T. cæspitum*, L., at Barnes Head, Cornwall; and *Antennophorus pubescens*, Wasm., a species new to Britain, taken on *Lasius flavus* at Whitsand Bay. — Mr. W. E. Sharp exhibited examples of the following Coleoptera from the West of Ireland to illustrate the prevalence of colour variation in that region:—*Carabus nemoralis*, Müll., *C. granulatus*, L., *C. arvensis*, F., *Notiophilus aquaticus*, F., *N. biguttatus*, L., *Leistus ferrugineus*, L., and *Corymbites cupreus* var. *æuginosus*, F.—Mr. H. St. J. Donisthorpe also showed three melanic forms of *Carabus nitens*, *C. arvensis*, and *Pterostichus dimidiatus* from the New Forest; all quite black.—Mr. Sharpe, explaining his exhibit, said that in his opinion these dark forms were racial, and represented the survival of an older race, and that the melanism was not due to protective necessities, derived from the environment of the localities in which the several species existed. — Mr. H. Rowland-Brown exhibited a series of *Pieris manni*, Mayer, from Le Vernet, Pyrénées-Orientales, and called attention to the superficial differences which presented themselves when compared with imagines of *P. rapæ*. — Mr. E. C. Bedwell exhibited a series of *Cassida fastuosa* taken by him on Box Hill, Surrey, mostly from the leaves of young foxgloves.—Dr. G. B. Longstaff exhibited a series of thirty-three specimens of *Danaïda chrysippus* taken by him in Egypt and the Sudan during January and February, 1909. Two taken at Cairo, one at Kom Ombo, and one at Aswân were all typical, but somewhat dark. A few other specimens were seen at each of these localities, but none of them had white hind wings. At Khartûm, where the butterfly was fairly common, twenty-five specimens were taken; of these two might be described as typical, though lighter than the Egyptian specimens; in eight the veins near the middle of the hind wings were dusted with white scales; in seven the centre of the hind wings was more or less white, as in Moore's *alcippoides*; while seven might be described as typical *alcippus*, Cram. One specimen only was seen of the form *dorippus*, Klug, and this had the hind wings almost entirely white—*f. albinus*, Lanz. So far as could be estimated in the field, three-fourths of all the specimens seen at Khartûm were either *alcippus* or *alcippoides*. On the White Nile between El Duêm and Gebel En (lat. 14–12½° N.) four specimens were taken, three typical or nearly so, one of the *alcippus* form. These figures are in marked contrast to the proportions found by the President among Mr. Loat's captures on the White Nile in lat. 11–4¾° N.—Mr. T. Bainbrigge Fletcher, R.N., exhibited two mimics of *D. chrysippus*; the females of *Elymnias undularis*, and of *Argynnis hyperbius* (*niphe*), whose males in both cases show the ordinary coloration of the genera to which they belong. He said that although in the ordinary preserved condition the resemblance of these two females to *Danaïda* was rather "rough and ready," and by no means comparable to the close imitation of pattern seen in the female of *Hypolimnys* (also exhibited), yet under natural conditions of flight the likeness between model and mimic was exceedingly close and deceptive. — Mr. Fletcher also exhibited specimens of a large and conspicuous Mydacid fly, *Mydas ruficornis*,

Wied., which show a striking resemblance when on the wing to the large and powerfully armed Scoliid wasps so common throughout Ceylon; a red spider found on a "bilimbi" tree (*Averrhoa bilimbi*); some newly-hatched Mantids closely resembling, both in colour, size, and the quick jerky movements, the common leaf-nesting ant, *Oecophylla smaragdina*; examples of a small Pyralid moth, *Syngamia floridalis*, when flying exactly like a Coccinellid beetle; and a yellow-spotted Reduviid bug, *Acanthaspis quinquespinosa*, Fabr., an interesting case of warning coloration common to various Carabid beetles found in the same locality and situations (under logs, &c.).

Wednesday, June 2nd, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair. Mr. Frank Price Jepson, of Pembroke College, Cambridge and Thanet Lodge, Bromley, Kent; Mr. Ernest Charles Chubb, of the Rhodesia Museum, Bulawayo, South Africa; Mr. John F. Musham, of 53, Brook Street, Selby, Yorkshire; and Mr. Oscar Cecil Silverlock, of "Allington," Burbage Road, Herne Hill, S.E., were elected Fellows of the Society.—Mr. Selwyn Image exhibited an example of the North American sawfly, *Sirex caudatus*, Cresson, bred from a larva found at Highbury in a piece of wood, together with photographs of the larva and its galleries by Mr. Hugh Main.—The Rev. G. Wheeler brought for exhibition a series of *Anthocharis tages* var. *bellezina* from Aix-en-Provence taken this year, and of *A. belia* from the South of France for comparison; also a series of *Lycæna corydon* with dark under sides—the typical form in the south.—Lord Walsingham showed two set examples and pupal cases of *Holocacista rivillei*, Stn., called by the late Mr. Stainton "The lost Pleiad," because originally described in 1750 and not again found before 1870, mining leaves of the grape-vine.—Dr. T. A. Chapman exhibited specimens of *Callophrys avis*, a new species from the South of France, first taken by him at Hyères three years ago, and in the following year, and now obtained by him this year from the Pyrénées-Orientales; and two examples of *Pararge ægeria* from Southern France, with a typical Southern specimen (*ægeria*) and an English one (*ægerides*), for comparison, the French form being as far from *ægeria* in one direction as *ægerides* is in the opposite, and possibly a Mendelian variety.—Dr. T. P. Lucas, who was present as a visitor, brought for exhibition a box containing thirty-one species of butterflies taken by him in the neighbourhood of Durban in two hours. He also gave a short account of the abundance of Lepidoptera at Brisbane, Queensland.—Mr. E. C. Bedwell exhibited examples of the myrmecophilous beetle, *Heterius ferrugineus*, Ol., from Boxhill, a species not recorded from Britain for forty-six years.—Mr. H. St. J. Donisthorpe, specimens of *Formica exsecta* (one female and two hermaphrodites) from Aviemore, pointing out that it had never been recorded from Scotland or the North before; specimens of *Formica rufa-pratensis* (two females and two hermaphrodites), pseudogynes and micrergates, from Nethey Bridge, Inverness-shire, remarking that this was the dominant form there.—Mr. L. Doncaster, a drawer of *Abraxas grossulariata* and its var. *lacticolor*, illustrating breeding experiments, which showed that *lacticolor* is a Mendelian recessive to *grossulariata*, and that the sex-determinants also behave as Mendelian characters, femaleness being dominant; and that males are homozygous (pure)

in respect of sex, females heterozygous.—Mr. J. R. Tomlin, examples of *Micropeplus calatus*, Er., taken on marshy ground last April, near Cloghane, Co. Kerry, by Dr. Norman Joy and himself, an interesting addition to a small genus, so far reported only from Germany and Sweden.—Dr. G. B. Longstaff, a number of specimens of *Coccinella 11-punctata*, L., from the White Nile, taken during a migratory flight which lasted from 4.50 p.m. till nearly 6 p.m.; also a *Scarabæus* taken by him on the edge of the desert, within half a mile of the Sphinx, belonging to the Arabian species *S. compressicornis*.—Prof. E. S. Poulton, F.R.S., made the following exhibits:—(a) a beautifully carved scarab of about the sixth century B.C., from Upper Egypt, apparently copied from *Scarabæus sacer*; (b) species of two different genera of *Coccinellidæ* taken in cop. at Tubney, Berks; (c) a collection of Diptera from Oxford and the New Forest, with observations and captured by Mr. A. H. Hamm; (d) an example of the rare Castniid moth, *Castnia thearon*, Kollar (a Brazilian species) taken flying in his conservatory at Broadstone, Dorset, by Dr. A. R. Wallace, F.R.S.; (e) a series of forty-nine females and seven males of *Hypolimnas misippus* from British East Africa, to illustrate the heridity tendencies of the female forms; (f) examples of Müllerian mimicry in *Euplainæ*; (g) and a collection of small moths captured at sea, one hundred and ninety miles from, and south-east of, the Cochin China coast, sent to him with a short note by Mr. F. Muir and Mr. J. C. Kershaw, Fellows of the Society. Prof. Poulton then made some observations on the use of the saw of the sawfly during oviposition, supplementary to the discussion on the subject at a previous meeting, and also communicated "Notes on the Life-History of *Aulacodes simplicialis*, Snell," by Mr. Muir and Mr. Kershaw.—Mr. T. Bainbrigge Fletcher exhibited a collection of Lepidoptera common to the African, Indian and Australian regions, some of them occurring in America also, and remarked that it was incredible that, being extremely variable, they should retain their specific facies over the wide area of distribution in the absence of some fairly constant syngamic connection. He also showed a collection from Ceylon of black ants and their mimics; a mass of the Cingalese bug, *Dysderus cingulatus*, resembling a flower; and an example of the Coprid beetle, *Scarabæus gangeticus* taken on the wing carrying small winged Diptera of the Borboridæ. He suggested that the flies were rather passengers in search of their pabulum than parasites.—Mr. Hamilton H. Druce, F.L.S., communicated a paper "On some new and little-known Neotropical Lycænidæ."—Mr. Claude Morley, F.Z.S., communicated "A Description of the Superior Wing of the Hymenoptera, with a view to give a simple and more certain Nomenclature to the Alary System of Jurine."—Mr. H. St. John Donisthorpe, F.Z.S., read a paper "On the Colonization of New Nests of Ants by Myrmecophilous Coleoptera."—Mr. F. Enock, F.L.S., read a paper on "New Genera of British Mymaridæ (Haliday)." — H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May 13th*, 1909.—Mr. Alfred Sich, F.E.S., President, in the chair.—Mr. F. Coulsden, of Stoke Newington, was elected a member.

—Mr. Ashdown exhibited a bred series of *Spilosoma mendica*, from the New Forest, one female having the spots enlarged and with a tendency to coalesce into transverse fasciæ.—Mr. Buckstone, a specimen of *Bithys quercus* var. *bella*, taken at Oxshott, July 24th, 1908.—Mr. Joy, a living larva of *Hipparchia semele*, pointing out its protective habit of resting among dry bases of grass-stems.—Mr. Newman, living larvæ of *Dryas paphia*, *Argynnis adippe*, and *A. aglaia*, and a very large example of *Chrysophanus dispar*.

May 27th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Ramsey, of Kew, was elected a member.—Dr. Chapman exhibited two very extreme forms of *Pararge ægeria*, in which the fulvous areas were much enlarged. They were taken at Amelie les Bains.—Mr. Edwards and Mr. Carr, living specimens of *Cucullia chamomilla* from south-east London.—Mr. Smith, a melanic specimen, var. *haygarti*, of *Teniocampa pulverulenta* (*cruda*) taken at Dover in April.—Mr. Edwards, larvæ of the stag-beetle (*Lucanus cervus*) found in some rotting wooden palings on Shooter's Hill.—Mr. Newman, an unusually extreme melanic female of *Spilosoma fuliginosa* bred from Sheffield.—Mr. Sich, a peculiar aberration in the scaling of *Eupithecia castigata*.—Mr. West (Greenwich), specimens of the rare Coccinellid *Halysia 16-guttata*, taken in the New Forest by Mr. Ashby and himself, and a series of *Cassida fastuosa* taken in some numbers by Mr. H. J. Turner, at Box Hill, on *Inula conyza*.—Mr. Lucas read a paper entitled, "The Scotch Fir (*Pinus sylvestris*)," and illustrated his notes with a large number of lantern slides made from his own photographs, with a few slides of microscopical details by Mr. F. Noad-Clark.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — April 19th, 1909.—Mr. R. Wilding in the chair.—A lecture was delivered by Mr. R. Newstead, M.Sc., on the "Natural History of Jamaica," with especial reference to the insect fauna of the island, notably certain pests allied to the Insecta which had been particular objects of study, *viz.* the cattle ticks. The lecture was fully illustrated by lantern-slides, and by specimens brought back by Mr. Newstead. The results of the expedition, due to the initiative and support of Sir A. L. Jones, will be fully reported upon officially.—Dr. Tinne exhibited a series of *Canonympha typhon* from various localities to show the range of variation in the species.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—March 16th, 1909.—Mr. A. W. Mera exhibited *Stauropus fagi*, taken at Hammer-smith in 1863.—Mr. A. J. Wellsdon, *Camptogramma fluviata*, bred from Bournemouth female, including many examples with interrupted fascia.—*Discussion.* Dr. T. A. Chapman opened a discussion as to the cause of the scarcity or absence of a species (of Lepidoptera) that sometimes follows a period of exceptional abundance in some particular locality. The opener advanced as a possible explanation the theory that abnormal abundance might be due to the temporary inactivity of some selective and destructive force; comparatively unprotected individuals would thus be allowed to

escape, and their unprotectedness would be transmitted to and accentuated in subsequent broods. Thus, when the selective agency again became active, the race would be exceptionally vulnerable to its attacks, and the species would be nearly exterminated until it was gradually selected up to the average of its protective potentiality, and its normal numbers so re-established.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

1. *Note on the Classification of the Dermaptera.* By M. BURR, B.A. 1 pl. (*Deutsche Entomol. Zeitschr.* 1909.)

Mr. Burr asks for criticisms of this scheme of classification.

2. *Neurópteros nuevos de la fauna ibérica.* By R. P. LONGINOS NAVÁS, S.J. 1 pl. (*Actas y Memorias del Primer Congreso de Naturalistas Españoles*, 1908.) Zaragoza. 1909.

Eleven new species of Neuroptera (wide sense) are here described.

3. *Mantispidos nuevos.* By R. P. LONGINOS NAVÁS, S.J. Barcelona. 1909.

Fourteen new species of this interesting family of Neuroptera (restricted sense) are characterized in this paper from 'Memorias de la Real Academia de Ciencias y Artes de Barcelona.'

4. *Report of the Entomological Society of Ontario, 1908.* Toronto. 1909.

This report of one hundred and fifty-two pages, with a number of illustrations, contains a mass of entomological lore, chiefly having to do with the economic side. There is an article on gall-insects by T. D. James, illustrated by plates A—R and figures in the text.

5. *Christ's Hospital Natural History Society Report for 1908.* Horsham. (Some notes and records are embodied.)

Judging by this report the Society is in a flourishing condition. Its motto, "In Natura Deus," will appeal to the genuine lover of Nature.

6. *Ants found in Great Britain.* By H. St. J. DONISTHORPE, F.Z.S., F.E.S. 1908.

This is a paper read before the Leicester Literary and Philosophical Society, in which the author gives short interesting notes on the appearance, habits, distribution, and so forth, of the British ants, including introduced species. As Mr. Donisthorpe has taken all the British ants, he is able to speak with authority on these interesting insects. The paper will be of the greatest value to students of our Hymenoptera.

W. J. L.

Proceedings of the South London Entomological and Natural History Society, 1908-9. With four plates. Pp. i.-xvi., 1-110.

THE publication of this excellent little annual is always awaited with interest, and its advent welcomed, not only by the members of

the Society but by many students in entomology and other branches of natural history.

Numerous items of importance are to be found in the abstract of the business transacted at the meetings, which are held in the evenings of the second and fourth Thursdays of each month throughout the year.

The wide range of subjects engaging the attention of the members is well illustrated by the five papers printed in the present volume. These are:—"Effects of Physical and Chemical Agencies on Lepidoptera" (H. S. Fremlin, M.R.C.S., F.E.S.); "House Moths" (A. Sich, F.E.S.); "Notes on Hungarian Butterflies" (A. H. Jones, F.E.S.); "Insects as Carriers of Disease" (H. S. Fremlin, M.R.C.S., F.E.S.); "Orchids and their Cultivation" (W. J. Kaye, F.E.S.). In addition to various other matters of interest adverted to by the President (Mr. A. Sich) in his address is an exceedingly able discourse on the antiquity of natural history study.

A Survey and Record of Woolwich and West Kent. Edited by C. H. GRINLING, T. A. INGRAM, M.A., LL.D., B. C. POLKINGHORNE, B.Sc., F.C.S. (the late), and others. Pages i-viii and 1-526. Woolwich: Labour Representation Printing Co., Ltd. 1909.

THIS volume is the result of a remarkable effort of local co-operation in scientific study. The South-Eastern Union of Scientific Societies having accepted an invitation to hold its Twelfth Annual Congress in Woolwich, in June, 1907, a local Committee was formed, and it resolved to commemorate the Congress by making a series of surveys of the district and publishing them as a local scientific handbook. This resolution has been carried out by the united labour of a large number of workers, and the surveys form an invaluable book of reference to local students of natural history.

The Geological Section, pp. 3-30, is edited by W. Whitaker, B.A., F.R.S., F.G.S.

The Botanical Section, pp. 31-230, is a Flora of Woolwich and West Kent, edited by J. F. Bevis, B.A., B.Sc., and W. H. Griffin. More than two thousand species are recorded, with notes on the nature of the habitat and actual localities where found, with dates. More than half the entries appear here for the first time, and several new county records have been established.

Mr. J. W. Tutt, F.E.S., has edited the Zoological Section (pp. 231-440). In this part the annotated list of Coleoptera runs to 53 pages, and comprises over 1200 species; whilst the list of the Lepidoptera, with localities, &c., extends to 87 pages. Of Hemiptera, 223 species of Heteroptera and 150 of Homoptera are entered; this list is founded on the work of Mr. W. West, of Greenwich. Owing apparently to a dearth of observers in the past, some orders of the Insecta are not mentioned, and Neuroptera is only represented by 8 species of Odonata.

There is also a section on Archæology, a Survey of the Scientific Industries along the Thames from the Ravensbourne to the Darent, and a note on Woolwich as a Centre for Photography.

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ORTHOPTERA IN 1908.

By W. J. LUCAS, B.A., F.E.S.

BUT little of special interest seems to have come under observation during 1908 in connection with the British Orthoptera. All we can say is that we have obtained a little more information as to the range of the species, and that some additions, also slight, have been made to our knowledge in regard to their habits.

EARWIGS.—On August 10th three specimens of *Labidura riparia*, one being a large male, were captured four or five miles from the spot on the shore near Bournemouth where they are usually found, and on August 12th Mr. A. H. Hamm obtained a specimen at a spot between these two localities. In life these earwigs are of a dirty cream tint, with a little darker colouring in places, and therefore are extremely well hidden from casual observation by their resemblance to the pale yellow sand which fringes the shore. They do not, however, lay themselves open to detection, as they remain in hiding during the day. One of those captured on August 10th was set free, when it ran very rapidly over the sand and soon found a crevice in which to hide. Feeding of course takes place at night. The large male, as well as the third one mentioned above, were kept alive under observation, being fed on animal food. The male ate rapidly off a small portion of kipper given it, and was equally satisfied with whiting. It fed freely also for a time off a fragment of rabbit. Although it attacked white of egg, it appeared to have no great liking for it. On my return they were taken to Kingston, but on September 27th the large individual was found to have almost entirely consumed the smaller one, although they had been living together for some time. In November the survivor paid a visit to South Woodford for a week or two, Mr. Main wishing to obtain its portrait. At the beginning of December it did not appear to be feeding. When food was placed in the box with it no movement was made at first, but in one to two minutes it roused itself, waved its antennæ, turned towards and then

approached the food, apparently being always perfectly certain with regard to the direction in which it lay. After living in captivity over four months it succumbed during the Christmas season.

In September Mr. J. R. le B. Tomlin bottled for me a couple of *Labia minor* at Ledbury, in Herefordshire, but unfortunately a beetle ate them. On the occasion of the South London Society's excursion to Oxshott, on September 19th, Mr. W. J. Ashdown found a dead male, and during the Fungus foray of the same Society to Oxshott, on October 3rd, Mr. S. R. Ashby obtained another male. On September 30th Mr. F. M. Dyke captured a male which settled on his hand as he was walking along Southwark Street, near Blackfriars Bridge (*vide* vol. xli. p. 273).



Abnormal callipers of
F. auricularia ($\times 10$).

Forficula auricularia, the common earwig, seems to be somewhat subject to deformity in its callipers, and one so affected, taken in a garden at Teddington, Middlesex, seems of sufficient interest to be figured. The right branch of the callipers is normal, of the small rounded type; the left is simple, and gives one the impression that the base of it is within the creature's abdomen.

COCKROACHES.—Two dark examples of *Ectobia panzeri* were found on breaking up a decayed tree-stump by the side of Beaulieu River, in the New Forest, on August 14th, and Mr. E. C. Bedwell gave me a female of this species, taken at Deal in August, which had its legs pale except for the knees and parts of the tarsi. On February 17th I received from Mr. H. Bradshaw a lively specimen of *Rhyparobia mederæ*, taken the same day in a greengrocer's shop in Berrylands Road, Surbiton. It was found in some sea-kale beneath bananas which came from the Canary Islands. From Mr. G. T. Lyle I received a specimen of *Leucophæa surinamensis*, which was found crawling about on Christmas Day in a hothouse at Bishopstoke, Hants. Is this cockroach to become a pest in warm plant-houses in this country?

LOCUSTIDS (long-horned grasshoppers).—On August 18th, in the New Forest, some wood-ants (*Formica rufa*) were trying to carry away so large an insect as *Leptophyes punctatissima*. Could they possibly have succeeded?

Mr. Tomlin obtained *Meconema varium* in his sweeping-net at Streatley on October 2nd. It was obtained from a fence in Fassett Road, Kingston-on-Thames, September 13th, and was captured on the South London Society's excursion to the Oxshott district on September 19th. The female of a pair taken on this

date and put into a box without food ate a great part of the male, but whether the latter had died first I cannot say.

Mr. M. Burr tells me that he took the far from common species, *Xiphidium dorsale*, in a swamp near Eastry, Kent, on July 26th. A female *Locusta viridissima* was taken on the cliff-side near Swanage on August 17th. Mr. H. Champion tried very hard to find the scarce *Platypleis roesellii* at Herne Bay, but was not successful.

ACRIDIANs (short-horned grasshoppers).—On September 13th I paid a visit to Bookham Common in search of *Gomphocerus rufus*, this being the only locality for it with which I am personally acquainted. A few of both sexes were obtained in one spot, but not without a considerable amount of search.

G. maculatus, one of the earliest grasshoppers to become mature, I captured first at the Devil's Punch Bowl, Hindhead, Surrey, on June 24th. Mr. Tomlin took it at Tubney, Berks, on July 5th.

Stenobothrus bicolor was obtained at Sharnbrook, Bedfordshire, on July 11th; on a cliff-side near Swanage on August 17th; on Shotover Hill, near Oxford, on September 9th; in Middlesex, near the Thames side opposite Surbiton, on September 14th; and latest on Esher Common, Surrey, on October 11th. Mr. Tomlin took it in August at West Malvern, in Herefordshire.

S. parallelus occurred on a cliff-side near Swanage on August 17th; Mr. Tomlin took it at West Malvern in August. It was found on Shotover Hill on September 9th, and a single female was met with as late as October 31st in the New Forest.

A mature male *Mecostethus grossus* was taken in the New Forest on August 1st, but I do not think I noticed a female till August 21st.

One specimen of the scarce *Tettix subulatus* was secured on August 12th by the side of a pond near Holmsley, in the New Forest. The common species, *T. bipunctatus*, Mr. Tomlin took at West Malvern in August, and I took one in the New Forest on November 1st, this being my last grasshopper captured during the season of 1908.

ON THE PERPENDICULAR DISTRIBUTION OF THE PAPILIONIDÆ IN THE HIMALAYAS.

By W. HARCOURT-BATH.

WHEN in the spring of 1897 I availed myself of the opportunity of visiting the South-eastern Himalayas in pursuit of insects of various orders, I found the Papilionidæ so much in evidence, both as regards the number of species and individuals, that I decided to specialise upon this magnificent family of Lepidoptera, and the study of their vertical or perpendicular distri-

bution, as hitherto, constituted the pivot upon which I based my observations and particular line of inquiry. Although the Himalayas, according to geographers in general, consist of five principal parallel chains or ranges, two of which are situated upon the plateau of Thibet, for zoological and botanical purposes they are usually considered as including only that particular portion known as the central or meridional ridge, on the austral or Indian side of the high Asiatic tableland, together with its numerous spurs and continuations to the south. On the extreme western side the range is bounded by the Indus, where it makes a sudden bend and debouches into the plain, while on the east it terminates at the romantic gorge of the Brahmaputra or Tsangpo. Within these well-defined limits, which extend for about fifteen hundred miles in length and vary from one hundred to two hundred miles in width, the number of species of Rhopalocera possibly falls not far short of one thousand. Of this number, indeed, nearly six hundred and fifty different species have already been recorded from Sikkim and Western Bhutan alone, as many as six hundred and thirty-one having been particularised in the admirable "List of the Butterflies of Sikkim," by the late Lionel de Nicéville, in the 'Gazetteer of Sikkim,' published at Calcutta in 1894; while at least seventy additional species have been enumerated from the North-western Himalayas.

Of the family under consideration in the present paper fifty-two species are included in the above list by de Nicéville as inhabiting the circumscribed district named, while at least five others are known to occur in the Himalayas to the west of Nepaul, this interesting intervening country at present being a *terra incognita* to the entomologist. The latter remark also applies to the continuation of the chain to the east of Sikkim, namely, in Bhutan and South-east Thibet, where the Lepidoptera fauna will be found, in my opinion, to approximate more closely as regards the purely tropical element with the lower woody, hilly districts to the south of the Brahmaputra in Assam. When these countries are explored entomologically I have no hesitation in saying that the number of Papilionidæ occurring in the entire range of the Himalayas will be eventually increased to quite seventy. The number enumerated in the preceding catalogue as occurring in Sikkim, alone, far exceeds that existing elsewhere in anything like the same area, not only in the remaining portion of the excessively rich Indo-Malayan region, to which the Himalayas principally belong, but as regards the still richer lepidopterological fauna of the neotropical region in South America. For although collectively exceedingly rich in Papilionidæ, as well as in other families of Rhopalocera, all the larger islands of the East Indian Archipelago belonging both to the Indo-Malay and Austro-Malay sections, situated either directly under the Equator or in close proximity thereto, upon

either side, can, individually, rarely produce more than from one to two dozen species—that is, from twenty-five to fifty per cent. less than is the case in the small Sikkim section of the South-eastern Himalayas. Even in the comparatively well-known and much more extensive continental district of the Malay Peninsula the number of species belonging to this particular family, as recorded by Mr. W. L. Distant in his excellent work on the ‘Butterflies of the Malay Peninsula,’ falls short of the number inhabiting the very circumscribed area of Sikkim by fourteen. And what makes this fact the more remarkable still is that the latter district is situated not only remote from the Equator, but is wholly outside the Tropics besides. This singular superfluity of species, however, is shared by all the other families and sub-families of Rhopalocera, with the exception of the smaller statistically and more strictly equatorial Euplœinæ, Elymniinæ, Morphinaæ, and Nemeobiinæ. In short, as the late lamented Mr. Lionel de Nicéville remarked to me upon the occasion of a visit which I paid to him at the Indian Museum in Calcutta, “Nowhere else in the Eastern Hemisphere will one find butterflies so abundant either in species or individuals.”

In some measure this is to be accounted for by the continuous succession of phytogeographical and climatal conditions produced by the temperature and precipitation at different levels, at least as regards the number of species is concerned, and provides a somewhat parallel case to the conditions which exist in the Alps of Central Europe, the species becoming similarly less numerous as one recedes therefrom upon either side. But as regards the overwhelming number of individuals of many species to be met with in the South-eastern Himalayas another set of factors apparently comes into play. Without, however, entering here into a discussion as to the cause or contributory cause of the latter remarkable phenomena, I will just venture the remark that in my opinion the organic competition in the shape of animal enemies, chiefly ants, is possibly less severe in the Himalayas than it is further south, an assertion founded principally on personal observations in Ceylon, where, notwithstanding the wonderful richness and marvellous luxuriance of the vegetation, butterflies are comparatively very scarce in individuals (with a few exceptions), while ants, which probably constitute their principal enemies in the adolescent state, are, on the other hand, exceedingly abundant there. In this “Isle of Spices,” in fact, I found butterflies less plentiful in individuals, and the number of species to be procured in a single day frequently fewer than in many localities in the South of England. That this was not my experience alone, I may recall the fact that the late Sir Greville Smyth, whom I met collecting up at Kandy upon various occasions, remarked to me that, although he had made several visits to Ceylon, he had always found

butterflies scarce. This may be an extreme example, but it is possible to see as many butterflies in the Sikkim Himalayas in the course of twelve hours as in Ceylon during a stay of twelve months, if alone we except those wonderful migratory hosts (usually composed of three or four species only) which periodically make their appearance, and vanish completely out of sight a day or two afterwards. Anyhow, the singular fact remains that butterflies are by far more plentiful in species and conspicuous in individuals, in certain localities in the Himalayas, than is the case in any other portion of the Eastern Hemisphere, inside the Tropics or without, and this applies with equal force to the Papilionidæ. Indeed, the very first butterfly that I espied on the ever-memorable occasion of my premier journey up the "Hills" by the diminutive train of the Darjeeling-Himalayan Railway from Siliguri was a brilliant, bounding, specimen of *Achillides paris*, this pre-eminently characteristic and extremely exquisite group of green-and-blue-spotted, spoon-tailed, Oriental Papilios being represented by no fewer than four superb species in the immediate neighbourhood of Darjeeling (an additional species occurring in the Simla district), where they are popularly known to Indo-European and Eurasian residents by the appropriate cognomen of "Peacocks."

The majority of the tropical Himalayan Papilionidæ, including a couple of gigantic *Ornithoptera*, are generally of a larger average size than anywhere else; especially is this the case in extreme wet season forms which fly during the maximum phase of the south-west monsoon. Examples of these, I believe, exceed the dimensions of the same species (with one or two exceptions) elsewhere. These splendid insects, therefore, together with several species of immense silk-moths, the latter numbering in their ranks the largest species of Heterocera in the whole world, *Attacus edwardsi*, besides other magnificent species, provide pre-eminently suitable symbolical lepidopterological representatives of the most elevated and stupendous mountain system upon this terrestrial sphere. To the student of zoogeographical and phytogeographical distribution there is no more interesting field for investigation and inquiry than that supplied by the Himalayas, which provide in a small compass a complete compendium of all the zoogeographical and phytogeographical zones situated upon the horizontal isotherms of the earth. This is the case at least with the single exception of the equatorial, characterised by its cocoanut palms, which I have not seen growing further north than in the neighbourhood of the Ganges near Calcutta, where it is crossed by the Tropic of Cancer. All the other climatal belts are represented between thence and the Arctic Regions with characteristic fauna and flora to correspond.

Although, as I have already alluded to the fact, the Sikkim

Himalayas are situated wholly outside the astronomical limits of the Tropics (being between $27^{\circ} 5'$ and $28^{\circ} 10'$ north latitude), by reason of its sheltered position, equable temperature and superabundant precipitation, the tropical zone is powerfully represented in its animal and plant-life, which extends from the malarial Terai Jungle and Sal Forest at the foot of the outer hills at the low altitude of only about 200 ft. above the sea-level to 2500 ft. or thereabouts. To this circumscribed belt the most strictly tropical species of butterflies are chiefly confined. Among the Papilionidæ, which are specially characteristic of this zone, special mention may be made of the following:—*Ornithoptera rhadamanthus*, *Pangerana didoneus*, *Tamera castor*, *Menamopsis slateri*, *M. epycides*, *Isamiopsis teleachus*, *Paranticopsis megarus*, *P. xenocles*, *P. macareus*, *Pazala glycerion*, *Pathysa agetes*, *P. antiphates*, *P. anticrates*, *Zetides eurypylus*, *Z. bathycles*, *Meandrusa evan*. While the following, although they belong more properly to the fauna of the peninsula, may also be enumerated, namely:—*Menelaides aristolochiæ*, *Iliades polymnestor*, *Lærtias polytus*, *Orpheides erichthonius*, *Pathysa nomius*, the second and fifth of which are only occasional stragglers from the plains, and have not been known to perform their metamorphoses within the district under discussion.

Most of the typical forms of arborescent vegetation extend upwards to 5000 ft. or thereabouts, which may be taken to be the upper limits of the subtropical zone, between which and the one below there is apparently not a great deal of difference either in the zoological or the botanical physiognomy, so that the fauna and flora are in reality only an extension of the preceding, the principal difference consisting in the gradual elimination of the strictly tropical element towards the confines of the belt above. The majority of the intertropical species of butterflies ascend to various altitudes within this zone, for the most part, however, performing their transformations probably below 4000 ft., though in the imago state some of them may occasionally be seen considerably higher up the mountain sides, while towards the upper limits an entirely new element commences to come into existence in the shape of temperate modifications of a tropical fauna.

Between 5000 ft. and 7500 ft. or so the warm-temperate zone holds sway with its sombre, dense forests of dark olive-green oaks and chestnuts and thick undergrowth of laurels and ferns. It is here that some of the most interesting Himalayan Papilionidæ have their headquarters, the various species which are endemic or nearly so to this particular climatal belt consisting exclusively of temperate modifications of tropical forms belonging to the Indo-Malayan fauna, corresponding to those occurring in the more elevated districts of Southern China, most of them, indeed, being absolutely identical therewith. The following is a

list of these interesting Himalo-Chinese species :—*Byasa ravana*, *B. plutonius*, *B. alcinous*, *B. latreillii*, *Panosmiopsis janaka*, *Achillides krishna*, *A. arcturus*, *A. polyctor*, *Cadugoides agestor*, *C. go-vindra*, *Pathysa paphus*, *Dabasa gyas*, *Teniopalpus imperialis*, and *Armandia lidderdalii*.

Some of these also occur at equivalent elevations upon the plateau of the Cossyas in Assam, where in fact the exceedingly magnificent *T. imperialis* seems to have its metropolis, judging from its more frequent occurrence there than in the Himalayas. Darjeeling (where I made my headquarters) at the altitude of 7500 ft. above the level of the sea is situated towards the upper limits of the warm temperate zone, the mean annual temperature being 55° Fahrenheit. Here, as elsewhere on the sub-Himalayas or Outer Hills, particularly those which are in close proximity to the deep hot tropical valleys, such as the Teesta and the Rungeet, several otherwise strictly tropical species occasionally ascend to the highest limits of this zone, a complete list of them, according to my own observations, being as follows :—*Ornithoptera cerberus*, *Pangerana astorion*, *Panosmiopsis rhetenor*, *Achillides paris*, *Sarbaria ganesa*, *Iliades agenor*, *Sainia protenor*, *Charus helenus*, *C. chaon*, *Dalchina sarpedon*, *Zetides agamemnon*. Three others—*Byasa dasarada*, *B. philoxenus*, and *Dalchina cloanthus*—are almost equally characteristic of the tropical and temperate zones, the two former occurring regularly up to 8000 ft., the latter up to 7000 ft., at least in the North-west Himalayas.

On the outer hills, from 7500 ft. up to fully 10,000 ft. above the sea-level, the peculiar Himalo-Chinese element (of which I have given a list), although in decreasing numbers, continues to predominate, that is to the extreme confines of the cold-temperate zone, with its deciduous trees of Central European aspect and appearance, but this is in reality rather owing to a paucity of palæarctic species of Rhopalocera than to a plentifulness of Indo-Chinese forms, and the same phenomenon precisely holds good with respect to nearly all the other groups of insects also. In the "interior" of Sikkim, however—that is, on the southern declivities of the meridional ridge of the great central snow peaks—the preceding condition of things begins to become reversed as low as 8000 ft., where, owing to a much drier atmosphere and a sunnier though colder climate, the temperate fauna and flora commence to predominate at a lower altitude than upon the outer hills, where the precipitation is so excessive, but the only representative of the palæarctic Papilionidæ which exists therein is a local form of the common *Papilio machaon*, which, however, is exceedingly plentiful in certain places. Even here there are several "Papilios" of Indo-tropical character, but they are all very scarce apparently in individuals. On the outer "hills" within the present zone the following may be

enumerated as being indigenous thereto—that is, undergoing their metamorphoses there:—*Byasa latreillii*, *Achillides krishna*, *A. arcturus*, *Teniopalpus imperialis*.

While in the “interior” I have only met with the penultimate species named, with a certainty, though I occasionally saw, but was not able to procure, specimens of a large black species, which I think possibly was the above-mentioned *Byasa latreillii* (better known as *P. minereus*). This happened near the junction of that exceedingly interesting district mentioned by Sir Joseph Hooker in his ‘Himalayan Journals,’ which constitutes the transitional area between the Indo-Malayan and Palæarctic regions, in which one may almost in the space of a few yards pass at once from a tropical to a temperate fauna and flora.

Between 10,000 ft. and 12,500 ft., which corresponds to the lower alpine zone, the only species which is indigenous therein is *Papilio machaon*,* which is, moreover, confined, as far as my experience is concerned, to the lower portion thereof, although several wanderers from the tropical zones occasionally pay it a visit during warm spells of sunshine at the height of the south-west monsoon, but they must invariably soon perish, like the locusts which sometimes succumb in swarms among the snow. I have thus seen males of *Iliades agenor* as high as 11,000 ft. at Yatung in the Chumbi Valley, in Thibet, which is physically, though not politically, part of the Bhutanese Himalayas. Tropical species of other families occasionally soar even higher still during exceptional spells of warm sunny weather experienced at intervals towards the middle heights, but they none of them perform their metamorphoses at anything like these elevations in the Himalayas, though they look sufficiently out of place in the winged state among the forests of firs and larches which clothe the mountains above 10,000 ft., as in like manner near the sea-level in Norway.

Towards the upper limits of the sub-alpine belt—that is, on approaching the termination of the forests of conifers—no species of Papilionidæ are apparently indigenous,† but on making an exit into the upper alpine or pseudo-arctic zone at 13,000 to 14,000 ft. or thereabouts, and arriving in the belt of bushes, gregarious rhododendrons of various species predominating, several species of *Parnassius* are encountered, which occur from thence right up to the perpetual line of congelation. This latter phenomenon prevails at an average elevation of from 16,000 to 18,000 ft. above the sea-level on the southern declivities of the meridional ridge of the Central Himalayas in Sikkim, though it is as much as from 1000 to 2000 ft. higher on the northern

* This refers to the South-eastern Himalayas only. In the Simla district Dr. G. B. Longstaff has met with *Parnassius hardwickei* as low as 10,000 ft. within the present belt.

† *Ibid.*

or Thibetan side, an anomaly which has been sufficiently explained by Sir J. W. Hooker in his well-known 'Himalayan Journals.'

The snow zone is practically only a continuation of the preceding, characterized botanically by its dwarf alpine herbs, the same as in the polar regions; while among the Parnassinæ, so typical of the lepidopterological fauna of the more elevated mountains of northern Asia and Europe, three species occur in Sikkim—*Parnassius hardwickei*, *jacquemonti*, and *acco*; with three others in the continuation of the chain towards the north-west—*Parnassius charltonius*, *actius*, and *stoliczkanus*. Of these I collected *P. hardwickei* and *P. jacquemonti*, both as high as 18,000 ft. on the southern ascent of the Donkia Pass, in close proximity to the Thibetan frontier.

In drawing up the accompanying list illustrating the vertical distribution of the Himalayan Papilionidæ, I have been guided principally by my own personal experiences in the Sikkim Himalayas, but where such first-hand information was wanting I have supplemented it by making use of the data contained in the 'List of the Butterflies of Sikkim,' by Lionel de Nicéville, already alluded to, as well as the admirable "Catalogue of the Lepidoptera of Sikkim," by Mr. H. J. Elwes, with the assistance of the late Otter Möller, published in the 'Transactions of the Entomological Society of London in 1888.' My principal object in compiling the same is to elicit further information respecting the vertical range of species which are either very rare or unrepresented in that part of the Himalayan chain which I visited, and must be considered as only of a preliminary character. The chief difficulty in the way of tabulating the vertical distribution of the Himalayan Lepidoptera consists in not being able to distinguish between those species which are truly indigenous to the various climatal zones—that is, performing their metamorphoses there, as most of the commoner species occasionally occur in the winged state only for several thousand feet above the altitude at which they underwent their transformations, either through a spirit of adventure, or by being carried up involuntarily, in a measure, by warm ascending currents of air, as I have frequently seen them during exceptional spells of hot weather experienced during the progress of the south-west monsoon. What is absolutely necessary is to ascertain where the different species undergo their adolescent existence, and this was out of the question during a short stay of seven months in the districts under consideration.

In the accompanying table the numbers in the columns correspond to the following climatal zones as defined by that great scientific traveller Baron Humboldt:—

(1. Equatorial Zone	...	...	Unrepresented.)
2. Tropical Zone	...	...	200–2500 ft.
3. Sub-Tropical Zone	...	...	2500–5000 ft.
4. Warm Temperate Zone	...	...	5000–7500 ft.

- | | |
|----------------------------------|-------------------|
| 5. Cold Temperate Zone | 7500-10,000 ft. |
| 6. Sub-Alpine or Sub-Arctic Zone | 10,000-12,500 ft. |
| 7. Alpine or Arctic Zone | 12,500-15,000 ft. |
| 8. Snow or Polar Zone | 15,000-17,500 ft. |

These figures must only be considered as approximately correct, as they vary greatly in different parts of the chain. In the interior of Sikkim, as well as in the North-west Himalayas, zones 2 to 6 are generally from 1000 to 3000 ft. lower, while in the latter part of the chain the alpine and snow zones rise considerably higher.

The following abbreviations have been employed:—

E. Signifies that the species is only found, so far as is known, to the eastward of Nepaul: 33 species.

W. That the species is confined to the west thereof: 5 species.

The number of species which range throughout the entire chain consisting of 19 species.

While the total number recorded from the whole of the Himalayas is 57 species.

* Denotes that the species is probably only an immigrant in the particular zone indicated, and does not perform its metamorphoses there. Including these occasional visitors, the number of species occurring in each climatal zone may be given approximately as under:—

2. Tropical Zone	36 species.
3. Sub-Tropical Zone	31 „
4. Warm Temperate Zone	28 „
5. Cold Temperate Zone	11 „
6. Sub-Alpine or Sub-Arctic Zone	3 „
7. Alpine or Arctic Zone	6 „
8. Snow or Polar Zone	6 „

In the South-eastern Himalayas, on the outer hills, zones Nos. 2, 3, 4, and 5 belong in preponderating degree to the Indo-Chinese province of the Indo-Malayan Region of zoogeographers, while in the interior thereof, zones Nos. 5 and 6 belong, in like measure, to the Manchurian province of the extensive Palæarctic Region; the latter, however, being considered, in the North-west Himalayas, as approximating more closely to the Mediterranean province of the same. Throughout the entire chain, zones Nos. 7 and 8 belong exclusively to the Siberian province of the Palæarctic Region of Messrs. P. H. Sclater and A. R. Wallace.

An analysis of the Himalayan Papilionidæ according to their zoogeographical affinities furnishes the following interesting results:—

Belonging to the Indo-Chinese province of the Indo-Malayan Region: 38 species (of which 9 also occur in the Indo-Malayan province).

Belonging to the Hindustani province of the Indo-Malayan Region: 2 species (of which 1 also occurs in the Cingalese province).

Belonging in equal degree to the Hindustani and Indo-Chinese provinces : 10 species.

Total for Indo-Malayan Region : 50 species.

Belonging to the Manchurian and Mediterranean provinces of the Palæarctic Region : 1 species.

Belonging to the Siberian province of the Palæarctic Region : 6 species.

Total for Palæarctic Region : 7 species.

But these statistics exclude the species of Indo-Malayan origin which also occur in the Palæarctic Region in the Himalayas, which, including immigrants, amounts to about ten, increasing the total of the family occurring in the Palæarctic portion of the chain to seventeen. While, if we include all those species which frequent the two temperate zones on the outer hills, which belong climatically, although not zoologically, to the Palæarctic Region, the number of tropical and temperate modifications of tropical forms belonging to the Indo-Malayan Region would be represented by the substantial total of twenty-eight, some eighteen being indigenous thereto, the remaining ten being only casual visitors. This affords an interesting comparison to that which is the case in the preponderatingly Palæarctic province of Northern China and Japan, where in corresponding climatal zones, though considerably further north, a somewhat similar intermingling of tropical and temperate forms takes place. Here, however, though the Indo-tropical element in the *Rhopalocera* fauna is probably equally in evidence as regards the number of individuals is concerned, the number of temperate Palæarctic species is considerably in excess. This, however, does not apply to the *Papilionidæ*, in which family, strange to say, the tropical element is most numerous in species, consisting, in fact, of seventeen to only five of a Palæarctic temperate character, according to Mr. H. J. Elwes in his interesting paper "On the Butterflies of Amurland, North China, and Japan," published in the 'Proceedings of the Zoological Society of London for 1881,' in which are given the names of as many as ten Himalayan species (including *Papilio machaon*), which are also found there.

It was no doubt the fact of the Indo-tropical facies being so pronounced that induced the late Dr. Staudinger to regard North China and Japan as an integral part of the Indo-Malay Region, although I personally fully concur with my venerable friend Dr. Alfred Russel Wallace in considering that they should be retained in the Palæarctic Region, to the Manchurian province of which they properly belong.

I will conclude by stating that the number of Himalayan *Papilionidæ* which range southwards to the equatorial districts of the Malay Peninsula, the Malay Archipelago, the Deccan, and Ceylon (including representative forms and geographical varieties) consists of at least twenty species.

LIST OF THE PAPILIONIDÆ OF THE HIMALAYAS SHOWING THEIR VERTICAL DISTRIBUTION.

CENSUS OF SPECIES.	CLIMATAL ZONES.								APPROXIMATE RANGE OF ALTI- TUDE IN FEET.
	2	3	4	5	6	7	8		
PAPILIONIDÆ.									
1. <i>Ornithoptera rhadamanthus</i> . E.	2	3							200-3000
2. <i>O. cerberus</i> . E.	2	3	4*						200-7500
3. <i>Pangerana astorion</i> . E.	2	3	4*						200-7000
4. <i>P. didoneus</i> . E.	2	3							1000-3000
5. <i>Byasa ravana</i>			4?						
6. <i>B. plutonius</i> . E.			4?						
7. <i>B. alcinous</i> . E.			4?						
8. <i>B. latreillii</i> . E.			4	5					7000-9000
9. <i>B. dasarada</i> . E.	2	3	4	5*					1000-8000
10. <i>B. philoxenus</i>	2	3	4	5*					1000-8000
11. <i>Panosmiopsis rhetenor</i> . E. ...	2	3	4*						200-6000
12. <i>P. janaka</i> . E.		3	4						3000-7500
13. <i>Menelaides aristolochiæ</i>	2	3							200-3000
14. <i>Achillides paris</i>	2	3	4*						200-7500
15. <i>A. krishna</i> . E.		3	4	5					3000-9000
16. <i>A. arcturus</i>		3	4	5					3000-9000
17. <i>A. polyctor</i> . W.		3?	4?						
18. <i>Sarbaria ganesa</i> . E.	2	3	4*						200-6000
19. <i>Iliades agenor</i> . E.	2	3	4*	5*	6*				200-11,000
20. <i>I. polymnestor</i> . E.	2								200-500
21. <i>Sainia protenor</i>	2	3	4*						2000-6000
22. <i>Charus helenus</i>	2	3	4*						200-7500
23. <i>C. chaon</i> . E.	2	3	4*						200-7500
24. <i>Tamera castor</i> . E.	2	3							1000-3000
25. <i>Lærtias polytes</i>	2	3							200-3000
26. <i>Orpheides erichthonius</i>	2								200-1500
27. <i>Menamopsis slateri</i> . E.	2								200-500
28. <i>M. epycides</i> . E.	2	3							200-3000
29. <i>Isamiopsis teleachus</i> . E.	2?								
30. <i>Chilasa clytia</i> (= <i>panope</i>)	2	3							200-3000
31. <i>Paranticopsis megarus</i> . E. ...	2?								
32. <i>P. xenocles</i> . E.	2	3							200-3000
33. <i>P. macareus</i> . E.	2								200-1000
34. <i>Cadugoides agestor</i>			4	5					5000-8000
35. <i>C. govindra</i> . W.			4	5					
36. <i>Pazala glycerion</i> . E.	2	3							2000-4000
37. <i>Pathysa paphus</i> . E.		3	4						3000-7500
38. <i>P. agetes</i> . E.	2								200-500
39. <i>P. antiphates</i> . E.	2	3							200-3000
40. <i>P. anticrates</i> . E.	2								200-1000
41. <i>P. nomius</i> . E.	2								200-500
42. <i>Dalchima cloanthus</i>	2	3	4	5					2000-7000

CENSUS OF SPECIES.	CLIMATAL ZONES.							APPROXIMATE RANGE OF ALTI- TUDE IN FEET.
	2	3	4	5	6	7	8	
43. <i>Dalchina sarpedon</i>	2	3	4					200-7500
44. <i>Zetides eurypylus</i>	2	3						200-3000
45. <i>Z. bathycles</i> . E.	2	3						200-3000
46. <i>Z. agamemnon</i>	2	3	4*					200-7500
47. <i>Dabasa gyas</i> . E.			4					6000-7000
48. <i>Meandrusa evan</i> . E.	2							
49. <i>Papilio machaon</i>				5	6			8000-12,000
TEINOPALPINÆ.								
50. <i>Teniopalpus imperialis</i> . E. ...			4	5				6000-10,000
THAIDINÆ.								
51. <i>Armandia lidderdalii</i> . E. ...			4					5000-5500
PARNASSINÆ.								
52. <i>Parnassius hardwickei</i>					6	7	8	10,000-18,000
53. <i>P. jacquemonti</i>						7	8	15,000-18,000
54. <i>P. acco</i>						7	8	
55. <i>P. charltonius</i> . W.						7	8	
56. <i>P. actius</i> . W.						7	8	
57. <i>P. stoliczkanus</i> . W.						7	8	

ON A NEW SPECIES OF *ZEUTHUS* (EUMENIDÆ) FROM BORNEO.

By P. CAMERON.

Zeuthus etchellsii, sp. nov.

Black; the clypeus except round the top and sides, the mandibles except the teeth, a small spot over the antennæ on the inner side and a line on the under side of the antennal scape, yellowish-white; wings fuscous-violaceous, the nervures black; the second abscissa of the cubitus bends downwards at the base and receives the second recurrent nervure at the apex of the bent-down part; the second transverse cubital nervure is broadly, roundly curved, the third cubital cellule is wider in front than behind. Clypeus almost as wide as long, rounded above, the apex broadly, but not deeply curved inwardly. The base of the first and of the second abdominal segment more shortly, distinctly narrowed; the petiole is almost as long as the following segments united; it is flat above, closely, but not very strongly punctured; the base is more or less finely, closely longitudinally striated; the base of the thorax is broadly rounded, laterally, the

centre transverse, keeled, the sides of the metathorax rounded at the apex. The third joint of the antennæ is as long as the scape, and fully one-quarter longer than the fourth. Metanotum short, sharply oblique, its centre without a distinct furrow. Head closely, the thorax more strongly, but not so closely punctured; the pubescence dense, longer on the head than on the thorax. There is a small tooth on either side of the apex of the first abdominal segment on the ventral side; the apex above is transverse and is not narrowed. ♂. Total length 21 mm.

Kuching, Borneo, July (John Hewitt).

There are no distinct grooves on the mesonotum nor on the scutellum; down the middle of the latter is a fine keel. The base of the metapleuræ is smooth, the base and apex of this part with a crenulated border. Palpi pale testaceous. There is a smooth, shining, triangular space on the sides of the metanotum at the base. The front is raised and transverse above the antennæ. The furrow separating the scutellums is narrow and moderately deep.

Allied to *Z. hero*, de Haan, and *Z. dolosus*, Bing.

This fine species is dedicated to my late housekeeper, Mary Etchells, in grateful remembrance of many years' faithful service.

DESCRIPTIONS OF THREE NEW SPECIES OF CICADIDÆ.

By W. L. DISTANT.

Rihana atra, sp. n.

♂. Body and legs black; eyes, coxal spots, basal joint of rostrum, and extreme apices of femora and bases of tibiæ ochraceous; ocelli and a central spot to clypeus (sometimes absent) sanguineous; tegmina hyaline, costal membrane black, venation piceous, basal cell hyaline with its upper half piceous, a basal claval streak pale emerald-green; wings hyaline, extreme base black and spotted with emerald-green, a streak of the same colour occupying the greater part of the inner or anal cell; head longer than half the breadth between eyes, including eyes broader than base of mesonotum; face moderately prominent, the transverse striations robust, centrally longitudinally finely sulcate; opercula not quite reaching basal joint of abdomen, moderately convex, their outer margins reflexed, their inner margins contiguous for about one-third from base and then obliquely directed to apices which are rounded, their surface coarsely wrinkled; posterior lateral margin of the metasternum brownish-ochraceous or piceous brown; posterior tibiæ with two slender spines beyond middle.

♀. Body beneath and legs paler, more or less brownish-ochraceous or piceous-brown; basal segment of abdomen above distinctly

posteriorly margined with brownish-ochraceous. Long. excl. tegm. ♂. 29 to 30, ♀. 26 millm. Exp. tegm. ♂. 91 to 94, ♀. 89 millm.

Hab. Philippine Islands; Manilla (C. S. Banks).

Allied to *R. bimaculata*, Oliv.

Rihana seminiger, sp. n.

♂. Body above black; eyes, posterior margin of pronotum, the narrow margins to two central obconical spots to mesonotum, the base of the cruciform elevation and the lateral margins of the metanotum, dull, obscure olivaceous; a large transverse lateral spot on each side of the second abdominal segment and a round spot on each side of base of anal segment cretaceous-white; head beneath, sternum and opercula thickly greyishly pilose; face with the transverse ridges black and with a central longitudinal ochraceous fascia which is centrally attenuated and also longitudinally continued on clypeus; opercula with their inner margins (broadly) and their outer and posterior margins (narrowly) black; abdomen beneath black, the abdominal segmental margins obscure olivaceous, a spot on each side of the second abdominal segment and one on each side of the sixth segment cretaceous-white; legs black, apices of femora and bases of tibiae more or less ochraceous; tegmina and wings hyaline, in some lights with a pale bluish reflection, the venation either piceous or brownish-olivaceous; tegmina with the costal membrane and basal cell brownish-olivaceous, the extreme base virescent; length of head more than half the breadth of space between eyes; face broadly, moderately prominent; opercula broad, not extending beyond base of abdomen, their posterior margins broadly rounded, their inner margins a little overlapping, their lateral margins nearly straight; rostrum slightly passing the intermediate coxæ, ochraceous, centrally, longitudinally and apically black. Long. excl. tegm. ♂. 30 millm. Exp. tegm. 97 millm.

Hab. India; Nilgiri Hills (H. L. Andrewes, Brit. Mus.).

Allied to *R. atra*, Dist., from the Philippines.

Terpnosia mawi, sp. n.

Head, pronotum and mesonotum virescent; head with broad anterior lateral margins to vertex, two large transverse anterior spots to front, area of the ocelli, and two small spots on each side between the ocelli and eyes, black; eyes brownish-ochraceous or piceous-brown; pronotum with two central longitudinal fasciæ, widened anteriorly and posteriorly and more divergent in front than behind, on each side of these a curved discal spot, and the furrows black; mesonotum with two short anterior obconical ochraceous spots the margins of which are black, a broad curved sublateral fascia on each side and an irregular cruciform spot in front of the basal cruciform elevation black, anterior angles of the cruciform elevation also black; abdomen above virescent or greenish-ochraceous, with a double discal segmental series of large spots, a lateral series of smaller spots and the apical area black; head beneath, sternum, legs and opercula virescent; base and two central longitudinal fasciæ (united posteriorly) to face, central fascia to clypeus, apex of rostrum, spines to anterior

femora, apices of tibiæ, and the tarsi black; abdomen beneath pale ochraceous, base (narrowly) and apex (broadly) black; tegmina and wings hyaline, the venation piceous; tegmina with the apical veins to the second and third ulnar areas infuscated, a small black and ochraceous spot at apex of radial area; face elongate, prominently transversely ridged on each side; rostrum reaching the posterior coxæ; length of head about equal to breadth between eyes; tympanal coverings narrower and shorter than tympanal cavities; opercula in male short, oblique, not quite reaching base of abdomen, the lateral margins moderately sinuate; anterior femora with three strong spines beneath. Long. excl. tegm. ♂ .26 millm. Exp. tegm. 68 to 70 millm.

Hab. China; Prov. Shen-se, Sin-ling (Wilfred A. Maw, Brit. Mus.).

Allied to *T. stipata*, Walk., from Ceylon.

ON TWO NEW GENERA (ONE REPRESENTING A NEW TRIBE) FROM BORNEO.

By P. CAMERON.

EUTANYCORMUS, gen. nov.

♂. Antennæ probably thirteen-jointed, the last (probably two closely amalgamated) thicker than the others, closely shortly pilose, the other joints of the flagellum fringed with longish stiff hair; they are placed shortly above the middle of the face. Eyes oval, malar space almost two-thirds of their length. Clypeus small, separated from the face by a wide semicircular depression. Pronotum twice the length of the mesonotum, not quite twice longer than wide, roundly narrowed in front. Mesonotum wider than long; parapsidal furrows distinct, running from the outer basal edge obliquely to the scutellum, from the base of which deep curved furrows run to the tegulæ; it is large, flat. Metanotum flat to the apex, which has a short steep slope; the lower part of the metapleuræ with an oblique furrow, which becomes gradually widened towards the apex. Abdomen flat, shorter than the thorax, the first segment almost sessile, as long as the following two united. Legs moderately stout, the hind femora normal, not much longer than the hind coxæ. Stigmal branch large, thickened, longish ovoid; there is no post-marginal vein; the margin nervure short compared with the submarginal, it being about one-third of its length; from near the base of the apical third of the submarginal a stout nervure runs obliquely to the posterior part of the wing. The hind wings have nervures as in the anterior, except that there is no stigmal branch. The head and thorax are more or less striated; the mandibles apparently edentate, the apex broad, oblique. Ocelli in a curve. Head seen from the front longer than wide. The abdominal sutures are transverse.

The female has the antennæ short, stout, the third joint distinctly longer than the fourth, the flagellum densely pilose; its apex does not reach to the tegulæ when turned back. There is a long, thin

ovipositor, longer than the body. There is a transverse furrow at the base of the scutellum, from either side of which a shorter oblique one runs along the sides. As in the male, I can detect no proper teeth on the mandibles; the apex of the latter has a furrow in the middle.

Belongs to the Toryminæ, in which it will form a new tribe sufficiently characterized by the densely pilose antennæ, and, more particularly, by the presence of the oblique nervure issuing from the submarginal. The latter is a feature which I cannot find in any Chalcid in my collection, nor can I find any genus described with such an additional nervure.

Eutancormus pilicornis, sp. n.

Black, smooth, and shining, sparsely covered with longish black hair; the antennal scape and legs rufo-testaceous, the mandibles and oral region of a slightly darker rufo-testaceous colour; wings hyaline, the nervures blackish, the stigmal spot longish oval. ♀. Length, 5 mm.; ovipositor, 8 mm.

Kuching, Borneo (John Hewitt, B.A.).

Metanotum, except the outer edges, transversely rugose; a curved crenulated furrow in the centre of the smooth outer part. Metapleuræ smooth above, the lower part striated at the base, the rest coarsely aciculated, the middle broadly depressed. There is a wide depression on the apex of the mesopleuræ, formed by the apex of the latter being depressed, and by the base of the metapleuræ being raised; the depression does not reach to the top of the pleuræ, and is narrowed above; it is finely, closely, longitudinally striated; the part above it is less closely striated. The collar is about one-half longer than wide, and is roundly narrowed at the base.

CLEONYMINÆ.

TAOGA, gen. nov.

Antennæ thirteen-jointed, the scape not reaching to the ocelli. Eyes hairy, large, oval, the malar space as long as them. Parapsidal furrows narrow but distinct. Scutellum large, its apex broadly rounded. Metanotum short, its apex transverse above; it has a steep vertical slope. Abdomen sessile, its base transverse, fitting close to the metanotum; the second segment fully one-half the length of the first, the third as long as them both united; its apical half has a central keel, which is prolonged along the back of the basal segment of the ovipositor; the latter is keeled along the sides; it is as long as the basal part of the abdomen; the following segment is half its length; both are densely pilose. The apical segments are apparently absent. Marginal branch half the length of the submarginal; the stigmal short, thick, dilated at the apex; the post-marginal branch short. Legs normal; the tarsi five-jointed, the spurs short; there are two on middle tibiæ; the claws short and slender. The antennæ issue from near the base of the clypeus, below the eyes; frontal depression wider below than the eye orbits; in the centre of the lower half is a wide keel, narrowed towards the top, where it is raised.

Ocelli in a triangle. The abdominal segments are transverse. There is only one spur on the middle tibiæ; it is small. Pronotum short. Labrum visible at the excised apex of clypeus.

Is nearest to *Elemba*, Cam., which may easily enough be separated from it by the eyes not being hairy, by the absence of parapsidal furrows, by the longer and thinner abdomen, of which the second segment is not as long as the first, and by the longer and thinner, more curved stigmal branch.

Taoga rufipes, sp. n.

Antennæ black, the basal half of the scape dark red, the legs red, the coxæ dark blue. Vertex black, tinged with blue, the occiput dark green, darker in the middle; the sides of front blue to near the bottom of the eyes; the lower part, face, and malar space emerald-green, as are also the outer orbits. The head is closely somewhat strongly reticulated, punctured, the vertex more finely than the rest. On the lower half of the antennal depression is a longish wedge-shaped keel, which becomes gradually narrowed from the bottom upwards. Basal joints of palpi dark red; the palpi densely covered with white pubescence. The sides of the head, pleuræ, and base of legs densely covered with longish white pubescence. Basal slope of pronotum emerald-green, bluer at the apex; there is a narrow smooth line down the centre. Mesonotum, scutellum, and apical slope of metanotum purplish black; a bluish purple mark on either side of the apex of middle lobe of mesonotum, the parts round the scutellum, the apex of scutellum, base of metanotum, apex of propleuræ, base and apex of mesopleuræ, and the metapleuræ bluish purple, the rest of the pleuræ blackish purple. Abdomen purple; the terebra black, the apices of the segments blue, smooth, and shining. Wings hyaline, iridescent, the stigma and nervures black; a narrow streak along the costa. ♀. Length, 14 mm.

Kuching, Borneo (John Hewitt, B.A.).

Closely punctured, the thorax slightly more coarsely than the head, the abdomen more finely than either; the punctures on the pleuræ running into reticulations. Pleural tubercles large, smooth, and shining. Middle lobe of mesonotum clearly separated, the furrows distinct. Malar space as long as the eyes, the middle furrowed.

NOTES AND OBSERVATIONS.

LYCÆNA CORYDON IN DEVONSHIRE.—Neither in the recent book, 'The Butterflies of the British Isles,' nor in the late C. G. Barrett's list in the 'Victoria History of Devon,' do I see any mention of the occurrence of *Lycæna corydon* in Devonshire. It may therefore interest you to know that I caught a male specimen of this species on the Devon coast, about two miles west of Beer Head, on August 6th, 1908. I gave the specimen at the time to a friend who was with me, and he subsequently wrote to me that he took another example of *L. corydon* at the same spot, on August 17th, 1908. The particular sea-bank

is much favoured by butterflies, and *Leucophasia sinapis*, *Adopæa actæon*, and *Lycæna adonis*, together with other local species, can be taken in plenty at the proper seasons. I have also seen *Zephyrus betulae* there.—(Rev.) F. L. BLATHWAYT; 1, Stonefield Avenue, Lincoln, July 12th, 1909.

EXTENDED PUPAL PERIODS IN THE GENUS *EUPITHECIA*.—Prof. Meldola's experience with *Eupithecia togata*, recorded in the current 'Entomologist,' p. 182, is by no means unusual for that species and several others of the genus. The following occur to me as prone to go over two winters in pupa: *E. venosata* and *pulchellata* (particularly Scottish), *E. haworthiata* (*isogrammaria*), *fenestrata*, *expallidata*, and, I think, *plumbeolata*. I have just had an interesting experience with *E. cretaceata*, the American variety or representative of *fenestrata*. From a number of larvæ collected in Vancouver Island in August, 1907, I bred fifteen moths between June 6th and July 8th, 1908; then no more emerged until yesterday (July 4th, 1909), when five appeared with a rush, within three or four hours of one another. No doubt the cold weather of June is largely responsible, but the effect is rather curious. There are few, if any, still left to emerge. I ought to add that several other species which I have bred largely have invariably, in my experience, emerged after a single hibernation, e.g., *E. castigata*, *absinthiata*, *denotata* (*campanulata*), *jasionæata*, &c.—LOUIS B. PROUT; 246, Richmond Road, N.E., July 5th, 1909.

GYNANDROUS SATURNIA PAVONIA (CARPINI).—From a hundred healthy Denbighshire cocoons of this species—only fifteen per cent. of which yielded imagos, the rest are lying over—I got a fine female, in May, ornamented with male antennæ. In all other characters the appearance of the moth is feminine.—J. ARKLE; Chester.

ENICMUS MINUTUS, Linn., ATTACKING CRYPTOCOCCUS FAGI, Bär.—During June, 1908, I noticed this beetle repeatedly among a strong colony of the Coccid upon the bark of a large beech-tree in my garden here. Upon one or two occasions, by the aid of a lens, I actually witnessed *E. minutus* masticating Coccids. This was called to my mind by to-day again noticing several individuals in the same position, but now both insects are much scarcer than at the corresponding period last year: I could discover but half a dozen beetles where there then were as many hundreds. The Coccid, too, is much sparser, which circumstance is doubtless due to the ravages wrought among it by the clavicorn in 1908. Among the *Enicmus* and *Cryptococcus* to-day I saw a couple of specimens of the rare Hemipteron, *Microphysa pselaphiformis*, Curt., which is suggestively stated to occur "on lichen-covered trees"; it was some time before I could satisfy myself that the bark was whitened by a Coccid and not lichen.—CLAUDE MORLEY; Monk Soham House, Suffolk, July 4th, 1909.

CURIOUS SEXUAL CONDUCT OF WEEVILS.—On Saturday last (June 19th) I was surprised to find on a low bush two green weevils (presumably of the *Polydrosus* family, but the precise species I know not) apparently *in cop.* with two females of a much larger species,

which I identify as *Polydrosus micans*. My first impression of a startling difference between the male and female of *micans* was momentary only, but the possibility of a hybrid between two such dissimilar species appeared to warrant further investigation, and the two pairs were accordingly placed in separate glass-tubes and taken home. On my arrival home I found that one pair had separated, and the male had apparently lost all interest in his companion; but in the other tube attempts at copulation continued from 7.30 to 11.30 p.m. uninterruptedly, but at the end of that time I shook the tube up, which separated the insects, and no further attempts were apparently made. In the morning the two were at different ends of the tube, each apparently ignoring the presence of the other. I am satisfied from a careful examination through a strong lens whilst the attempts were being made that copulation did not actually occur. The male organ was for the greater part of its length too inflexible to allow of the penetration of the female organ of the different species, the angle was not right. Save for this, the violent and repeated efforts of the male could only have ended one way. If two insects sexually ripe but of different species are isolated together, the abnormal may occur, but it did strike me as very strange that attempts of this sort should be made right out in the open, where one would have thought the females of the green *Polydrosus* would have far out-numbered the females of *micans*.—C. G. DOUGHTY; 27, South Molton Street, W., and Eghams Farm, Beaconsfield, June 22nd, 1909.

[It is frequently noticed that Coleoptera of two distinct species are in the position of copula without copulation subsequently occurring.—D. S.]

CAPTURES AND FIELD REPORTS.

ABUNDANCE OF *PIERIS BRASSICÆ*.—During the last three weeks of May *Pieris brassicæ* daily increased in numbers until the end of the month, when in this part of south-east Essex a perfect swarm occurred, but nearly all that I observed were males, it was only during the last few days of May that the females appeared in any number; until then I had not seen half a dozen, while the males were flying in hundreds. *Pieris rapæ* was equally prolific, but the sexes of more equal proportion.—F. W. FROHAWK; July, 1909.

PROPORTIONATE NUMBER OF SEXES OF *THANAOS TAGES*.—Although the males of most or all species of butterflies appear on the wing some days before the females, I think the following note is worthy of record, considering the date of observation and the fact that I noticed the species flying over the same spot six days previously. On May 21st last I captured forty-five *T. tages* over a small patch of rough ground about fifty yards long by ten yards wide; out of this comparatively large number only one was a female, which deposited a quantity of eggs. Last year, on the evening of June 10th, in the corner of an adjoining field, I found this butterfly in such abundance at rest on the heads of grasses that in some instances there were as

many as five resting together on the same grass-head; on this occasion both sexes were about equal in number.—F. W. FROHAWK; July, 1909.

ACRONYCTA ACERIS LARVÆ FEEDING ON PLUM.—In August last year I found four small larvæ of *A. aceris* feeding on the foliage of a plum-tree in the garden here. They were transferred to a breeding-cage and supplied with twigs from the plum. Pupation occurred in due course, and two male specimens emerged in late June of the present year. These are perhaps rather small, but they are certainly not less in size than some examples I have reared in former years from larvæ that had fed on sycamore.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

CIDARIA MIATA EMERGING IN JULY.—A small batch of the ova of this species were received from Burniston, Yorkshire, on April 25th last. Larvæ from these hatched out April 29th, fed well on sawfly, and by June 26th all had pupated. A male specimen emerged on July 5th, followed by another the next day, and two examples of the same sex on the 8th of the month. Between July 11th and 20th two other males and seven females appeared.—RICHARD SOUTH.

INSECTS IN SICILY.—With the Editor's permission I should like to thank my numerous entomological friends for their sympathy with me in the sorrowful time of the earthquake at Messina, which terrible event put a stop for some months to pleasant entomological excursions in the country. The first months of the year proved exceptionally wet, and as I had lost all my entomological apparatus, it was Easter (April) before I could resume collecting. I was then domiciled at Catania, and my first excursion was to the back of Mount Etna, stopping at several towns on the return journey from the mediæval town of Randazzo. A most interesting place for lovers of the antique—not to say ignorant and backward. Situated 3000 or 4000 ft. above the sea-level, the climate somewhat resembles that of England, and warm clothing was a necessity. Mount Etna rises over 10,000 ft., with snow on the upper half, while the nearest mountain to the west is less than 5000 ft., and is sown with corn to the summit. Amongst the boulders separating the cornfields we found a "tiger" caterpillar crawling about on the short grass, &c., very much resembling that of *A. fuliginosa*, but with black bands. I collected a dozen out of hundreds, and to my surprise I bred what I call the "black burnet" moth—*Syntomis phegea*. This insect seems generally distributed in Sicily; the first specimens I came across were in the plain of Catania, in May, almost on the sea level, and subsequently I found it plentifully at Taormina and also at Messina, where it can be picked off the flowers readily by its antennæ, being one of the most obtrusive of the Lepidoptera. The female readily deposits its eggs loosely in a pill-box, and when I reached England on the 16th of June I found that a batch of eggs laid the week before had just hatched. The young caterpillars resemble those of *Arctia villica* (the cream-spot tiger moth), and (imitation being the sincerest form of flattery) I have, in my small way, imitated the entomologists who are trying to re-introduce *Chrysophanus dispar*, whom I wish success,

so yesterday I chose what I considered a good locality near London, and sowed the youthful *phegea* larvæ amongst scattered plants of dandelion, a food they apparently approved of in confinement. Should any collector meet with the species in 1910, please communicate with me, and do not exterminate it.

Crossing the lava beds on Mount Etna between Bronté and Aderno, the "orange-tip" was flying amongst the spurge, almost the only plant which grows there, but which flowers almost as brightly as broom, quite different to our English spurge. The orange-tips seemed also to be far brighter than our English species, but my net was packed away, and I postponed capturing the specimens until a future early visit which never took place. At Aderno I had my net and captured my first *Papilio podalirius*, the loveliest flier amongst butterflies that I have come across. It does not fly, it simply "soars" in the air. This may be an Irish bull, but it is true. Close to Catania a "procession" caterpillar on the pine-trees was very common whenever the pine-trees occurred. Occasionally some caterpillars would be blown down from the large nests on the tops of the trees, and instinctively they formed a line, head to tail, and marched off to regain their food-plant. It was curious to watch a line, over a yard long, crossing the dusty roadway in perfect order. I kept some larvæ, which spun up, but have not yet produced moths, so I am not sure of the species.

Towards the end of May I returned to Messina and resumed my walks up the adjoining mountains. Each day I was able to get three or four fresh species of butterflies, mainly those we get in England, or reputed British species. I found it difficult to get an entire novelty. I own up that I was quite overwhelmed with delight when I got my first and only *Argynnis pandora*; the lovely under side is indescribable. *Charaxes jasius* (one only) does not soar like *P. podalirius*, but flies hurriedly. *M. didyma* makes a brilliant show when in numbers. Our own *P. machaon* frequents the hills, and has a curious habit of settling on a culm of long grass, and floating with open wings from side to side like an inverted pendulum.

As I had no means of setting my specimens, I put them in papers, with data. Later on I hope to set them, and shall then be able to make a complete list of my captures. Speaking generally regarding the butterflies of Sicily, it seems to me that Sicily would make a good appanage to Great Britain, and I am surprised to find that twenty degrees of latitude make so little difference—J. PLATT BARRETT; 30, Endwell Road, Brockley, S.E., July 10th, 1909.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 8th, 1909.*—Mr. Alfred Sich, F.E.S., President, in the chair.—It was announced that the collections of British and European butterflies made by the late Mr. F. Freeman, F.E.S., of Tavistock, Devon, had been generously presented to the Society by Mrs. Freeman, through Mr. Rowland-Brown. It is contained in two handsome cabinets. The

collection comprises series of almost every European species, as well as of many local and rare forms, including much of the material collected by the late Mr. F. Lemann, F.E.S. This is the only modern collection of European butterflies in London available for reference, and should be of great value to the rapidly increasing number of students of Palearctic butterflies.—Mr. Sperring exhibited a specimen of *Pararge megæra* from Somerset, in which the usually fulvous markings were of a pale straw-colour; together with five examples of *Ctenonympha pamphilus*, showing five distinct shades of colour, from Porchester, all taken at one time.—Mr. Edwards, a specimen of the rare *Opsiphanes cyme*, from Brazil.—Mr. R. Adkin, a bred series of *Odontopera bidentata*, of Yorkshire origin, and contributed notes on the results of the breeding, particularly with regard to the production of black forms.—Mr. B. Adkin, a short series of very curious small specimens of *Cidaria suffumata* from North Devon, showing very close superficial resemblance to *C. silaceata*.

June 10th.—Mr. W. J. Kaye, F.E.S., Vice-President, in the chair.—Mr. Stanley Edwards exhibited specimens of the centipede *Scolopendra morsitans*, from Jamaica.—Mr. Newman, imagines of *Dicranura bicuspis* from Tilgate Forest, *Dianthæcia conspersa* and *D. carpophaga*, and larvæ of *Gastropacha quercifolia*.—Mr. Main, two larvæ of *Limenitis populi* from Saxony, and the egg, cocoon, and young larvæ of *Hydrophilus piceus*, the large water-beetle.—Mr. Rayward, living larvæ of *Polygonia c-album* from the ova previously shown.—Mr. Tonge, on behalf of Mr. Grosvenor, ova of *Cyclopides palæmon* (*paniscus*).—Mr. F. Noad Clark, a dipteron bred from a larva voided by a sheep in its excrement.

June 24th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Newman, a very curiously mixed gynandromorphous specimen of *Saturia carpini*, mainly male but with female characters scattered about the wings and body. He also showed some almost black *Dianthæcia conspersa* from Shetland, living larvæ of *Nyssia lapponaria* from Glasgow, a very heavily dark-speckled form, and beautifully banded forms of *Angerona prunaria*, a living example of *Sesia andreniformis*, &c.—Mr. Green, a short series of *Leucania vitellina*, taken at sugar in East Kent in October, 1907 and 1908.—Dr. Chapman, specimens of the recently much discussed *Pieris manni*, taken by him in the Eastern Pyrenees during the present spring.—Mr. Turner, a number of figures of varieties of *Arctia caja*, and also the photograph group of the delegates and members of the Congress of the South-eastern Union of Scientific Societies, held at Winchester, which Messrs. Adkin, Sich, Step, Tutt and he attended.—Mr. Adkin, a specimen of *Nonagria* from Sussex that had been named *edelstoni*, and examples of the species commonly known as *neurica* (*arundineta*) and made remarks on the specific distinction of the two species.—Mr. Step, as delegate, read a report of the recent Congress at Winchester, giving a detailed account of the proceedings day by day.—Mr. Tutt read a paper entitled "The Darwin Commemoration—Thoughts—Species"—being reminiscences and reveries induced by the re-perusal of some of the volumes of the 'Entomologists' Weekly Intelligencer' of half a century ago.—HY. J. TURNER, *Hon. Rep. Sec.*

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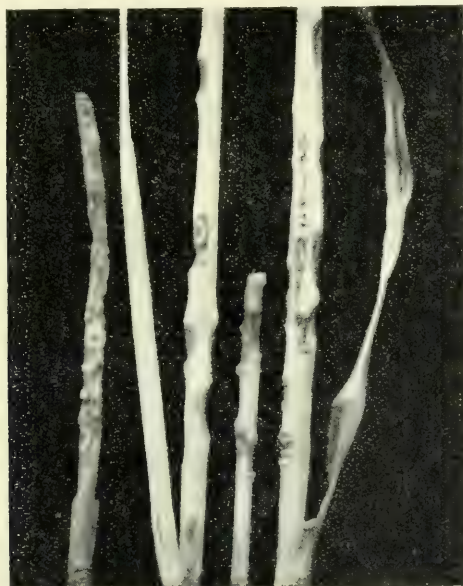
SEPTEMBER, 1909.

[No. 556

CLINODIPLOSI *EQUESTRI* (WAGNER); AN INSECT NEW TO GREAT BRITAIN.

BY FRED ENOCK, F.L.S.

It is with feelings of anything but pleasure that I record the appearance of this wheat "pest" in Great Britain. On August 18th, 1908, Mr. George E. Mainland, F.R.M.S., of Tenby, sent



Wheat-stalk, showing *larvæ in situ*, and damage between each joint and to the ear.

to me a box of wheat-stalks taken from a field in that neighbourhood. Between each joint, underneath the leaf-sheath, were from six to nine apodous larvæ of a bright red colour, resting in a curled position, each in a cavity in the stalk three-sixteenths

of an inch long, with a growth at the head and bottom, much resembling (in miniature) a niche in the wall of a cathedral. The larvæ were actively twisting about, evidently full-grown, for in a few days they left the stalks and buried themselves in the light soil from the field.

Specimens were sent (by the owner of the field) to the Board of Agriculture and Fisheries for name and information how to treat the pest which had attacked the wheat and barley. The advisers of the Board informed the owner that "the wheat was suffering from an attack of the Hessian Fly!"

As I had worked out the life-history of this destructive insect, I felt fully justified in flatly contradicting this statement, and some months after, when all the larvæ had buried themselves and so got beyond control, the advisers then informed the owner that the larvæ were those of *Diplosis aurantiaca*, "a dangerous wheat pest"; but, so far as I can ascertain, this was about all that was done by the Board of Agriculture.

I sent a photograph of the injured stalks to Dr. L. Howard, the United States Entomologist and Head of the Bureau of Entomology, Board of Agriculture; but he was glad to say that nothing of the kind had been seen in America, and that it was quite new to him.

I kept my larvæ in the soil until June of this year, when I found several in very much the same condition as when I last saw them. I asked Mr. Mainland to send me a good supply, which he did on June 12th. Some of these I observed change to pupæ, which very much resembled the larvæ in colour. Previous to pupating, the larvæ, by twisting and twirling, managed to bury themselves and scoop out a small oval chamber, in which they changed to pupæ. Some of these I ruptured in digging up, but in others observed the larval skin cast and the pupa evolved. At first the legs were difficult to discern, as they scarcely projected beyond the body. In the course of a week the wings and eyes began to darken, and the leg-sheaths were more distinct; the abdomen, too, and the dark dorsal marks became visible, until, just a month after pupating, I bred six of the female flies. These, together with my original photograph of the injured stalks, I forwarded to Mr. C. O. Waterhouse, who placed them in the hands of Mr. E. E. Austen, the Dipterist at the Natural History Museum, who very kindly searched out the true name—viz. *Clinodiplosis equestris* (of Wagner)—whose figure of the injured stalk agreed in every respect with my photograph. It appears that Wagner obtained his first specimens in 1865 and 1866 from Fulga, Cassel, Germany, but it has not been much heard of since that time.

Being anxious to learn all I could of this extraordinary "pest," I determined to visit the infected field near Tenby. On June 23rd Mr. and Miss Mainland visited the field, and observed

a vast number of midge-like flies swarming in the ridges (the field having been ploughed and potatoes were then growing). A high wind was blowing, making capture of the flies a very difficult matter; however, a male and two females were caught, and sent on to me. I recognized the similarity of colour on the abdomen of the female, but could not then say positively that these flies had emerged from the red pupæ, though I thought they had. Nothing more was seen of this great multitude of flies.

On July 9th I went down to Tenby, where, by the kind hospitality and guidance of Mr. Mainland, as well as the courtesy and assistance of Mr. Cole, upon whose field this pest appeared, I obtained a supply of the larvæ and pupæ by simply using my fingers to dig them up, their red colour making them very conspicuous objects in the bright sunlight. I also swept a number of female flies from the rank herbage around the field. These, as well as the three caught by Mr. Mainland, were identical with those I bred.

Up to the time of writing (Aug. 11th) nothing has been heard of its re-appearance, about which the Board of Agriculture, with its long list of "inspectors," appears not to have taken any more serious interest than when first informed of its presence in the wheat-stalks. The only time when it could and ought to have been burned in the field, the wheat was left to rot, and the larvæ were allowed to enter the earth and there remain to complete their transformations.

If human "Boards" are idle, *insects* are not, and by this neglect and ignorance there is now present with us (in ambush, maybe) a vast army of devastating insects which may yet make their presence felt; for, unlike the Hessian Fly, the Tenby pest can and has successfully passed through a very trying English winter.

THE LARGE "COPPER," ITS HABITS, AND ONE OF ITS PRESENT HAUNTS.

BY W. G. SHELDON, F.E.S.

I SUPPOSE there is no butterfly that has a greater attraction for the average British lepidopterist than our long lost glory, *Chrysophanus dispar*, and this species was one of the reasons that turned my steps towards the Danube this summer.

On the morning of June 1st last, at the early hour of eight o'clock, I walked out of the little wayside station of Kamaraerdo, some few miles south-west of Budapest, where I had been most kindly conducted by Professor Schmidt to see *C. dispar* alive. The country was very different in character to that frequented

by it in Britain, years ago, probably largely in consequence of the partial cultivation of its haunts. A valley some half-mile in width, the sides gently undulating up one or two hundred feet to its vine-clad crest on one side, and to the locally famous Budapest national playground, the Kammerwald, on the other. Except for a narrow strip at the bottom of varying width, the slopes were taken up by cultivation, and produced, in addition to grapes, luxuriant crops of wheat, barley, rye, sainfoin, potatoes, and maize; the remaining uncultivated portion being the present stronghold of *C. dispar*. Centuries ago this had been no doubt a quaking, undrained, reedy bog, where the food-plant flourished luxuriantly and the outflow from which found its way to the mighty Danube close by. Modern improvements had changed all this; down the centre ran a ditch, willow-planted, which had drained the water off, and into this ditch emptied at intervals smaller channels, each one of which played its part in the general scheme. This drainage system had converted the surface, leaving it moist indeed, but firm and covered with a thick crop of coarse grass, intermixed with flowering plants, amidst which the great waterdock grew abundantly in places.

The sun shone brightly that June morning, and we had not got ten yards from the railway station, when slowly flying along the grassy side of a ditch I saw my first large "copper" in the flesh, var. *rutilus* of course, but a very different object to the rather puny butterfly one usually gets from a dealer if a specimen is purchased; for, next to our own peerless type, the Budapest is certainly one of the finest, if not the very finest, form to be found anywhere. My largest male and female expand respectively 44 mm. and 45 mm., as against the 46 mm. and 49 mm. expanse of my largest British specimens.

There is no mistaking *C. var. rutilus* on the wing for any other European butterfly; the unique coloration identifies it at once. It has very similar habits of flight to the other European species of the genus, the males usually flying briskly but not fast over the long grass, with a jerky movement common to most of the *Lycænidae*, searching for the females; if another male is approached, either flying or settled on the grass, the two will rise in the air and fight together for a few moments, then separate and each pursue its way. It does not seem to be partial to resting on, or sucking at, the numerous flowers that grow in its haunts. I saw two or three specimens at rest on one flower or other, but these were quite the exception; it is very fond of, especially during the afternoon, settling on a grass stem, and opening its wings to their full extent to enjoy the gratifying warmth of the sun's rays. It is then a magnificent object, brilliant beyond one's power of imagination, a patch of living, sparkling, ruddy gold; but even a study of the brilliant upper side does not reveal all the glory of *C. dispar*. If you see

a male approaching, flying slowly towards you over the long grass, do not be in a hurry to effect a capture, but watch, and as it passes you will see the sparkling gem-like, red gold, upper side, mingle with the delicate blue-grey under side, and form a natural kaleidoscope, a dream of colour well-nigh incomparable. Certain other species of European "coppers" are brilliant and most beautiful, but there is something indescribable about *C. dispar* that, to my mind, places it in a class by itself for beauty.

The female is, of course, not so brilliant an object. She is generally to be found in some corner away from the usual haunts of the male, presumably after impregnation: one frequently observes her at rest during the morning, or she may be disturbed out of the herbage. During the afternoon she is usually seen flying slowly and steadily over the grass in search of the food-plant.

One gets the impression that *C. var. rutilus* is only here for a time, for the whole of the herbage is cut for forage every season when the young larvæ of the first brood are feeding, and it is difficult to understand how any large proportion can reach maturity. Some of the examples I captured were very small, one expanding only 28 mm., evidently the result of insufficient nutrition.

The melodious fluting of the golden oriole, and the unmistakable "Hoo, hoo, hoo," of the hoopoe, two of our rarest and most beautiful birds, now alas, like the large "copper," extinct with us, or visiting us only casually, added greatly to the interest and charm of a red-letter day in one's entomological life.

August 19th, 1909.

THE FOOD-PLANT OF *LYCÆNA* (*LATIORINA*) *ORBITULUS*.

By T. A. CHAPMAN, M.D.

WHEN I made the observations recorded in the 'Entomologist' for last May on this subject, I felt much doubt as to whether *Androsace vitaliana* was the food-plant of *L. orbitulus*. Although it was unquestionably the food-plant at Binn, it might be, after all, only a food-plant, one amongst others. This doubt was based on the fact that my memories of the various places in which I had met with *orbitulus* were unaccompanied, as a rule, with any recollection of *Androsace vitaliana*. This plant is, however, very inconspicuous, except when in flower, and as *orbitulus* flies after the flowering is over, it seemed quite possible that the *A. vitaliana* was really the food-plant.

Memory is not very trustworthy on a negative point like this, so that my doubts were not clear enough to justify me in expressing them when I wrote out the notes referred to. I,

however, determined to investigate the point on the first opportunity. This opportunity arrived this summer, when I observed *L. orbitulus* at several Swiss stations, and at Arolla met with it in sufficient numbers to enable me to follow the matter up. In none of these localities could I find any *Androsace vitaliana*; it was therefore evident that the food-plant of the butterfly in these localities must be some other species. The butterflies were not plentiful or the weather favourable enough to make the investigation an easy one, and I had to spend a whole day and portions of several others before I could satisfy myself as to the correct solution. In fact, I did not succeed in seeing one specimen lay an egg, but I found the females of *orbitulus* were always attracted to, and paid special attention to, one plant, and on one occasion, and perhaps on a second, an egg appeared about to be laid, but actually it was not done. The plant proved to be *Soldanella alpina*. Butterflies in captivity laid freely on this, and the young larvæ now hatched eat it readily.

It is no doubt a fact well known to botanists, but to me it was quite a discovery to find that *Soldanella alpina* was an abundant plant over large tracts of the alpine pastures between 6000 and 8000 ft., forming quite an appreciable portion of the herbage. The ordinary tourist, from whom botanically the average entomologist can hardly be differentiated, looks on *Soldanella* as only occurring at very high elevations (8000 to 9000 ft.), and near to snow, and then rather sparingly. This is true, however, only of plants in flower in high summer, say July; I must confess to having had some such ideas.

The plants at lower elevations must flower very early. Not only the flowers, but also the fruits (if any), had disappeared in the haunts of *orbitulus* at the end of July.

Soldanella alpina is therefore the food-plant of *L. orbitulus* at many, if not a majority, of its habitats. On the *Soldanella*, as on the *Androsace*, the larva lives on the leaves and not on the flowers; though assuming, as seems probable, that it hibernates half-grown and feeds up in the spring, it may at that time attack the young inflorescence.

Unfortunately both my plants and larvæ have suffered by the unavoidable ill-usage of travel, and I much doubt if my material will enable me to carry the life-history further than I did last year.

Soldanella, like *Androsace*, belongs to the Primulaceæ, so that it seems very probable that *L. orbitulus* may also feed on some other plants of that order, *Androsaces* or alpine *Auriculas*. Both plants have thick fleshy leaves, and the larva bores into these and scoops out the parenchyma through a small hole, much as a *Coleophora* would do, or as the flower-buds are treated by the young larvæ of *argiolus*, *bætica*, and other flower-eating *Lycænids*.

ABERRATIONS OF *VANESSA URTICÆ* AND *V. IO*.

BY T. REUSS.

Fig. 1.—*V. urticæ* ab. *luna*, n. ab.Fig. 2.—*V. io*, ab.

I WOULD like to record that on the 26th of July I bred a variety of *V. urticæ* L. (Fig. 1), which showed the following varietal characters:—

Upper side: on the fore wings there are only three blue lunules in the median part of the black marginal band, the four apical and the two lunules of the inner angle being replaced by black. The yellow spot between the second and third costal blotches is crossed with black. Hind wings: again in the black marginal band the four (in the right wing three) blue lunules of the costal and median part are either very faint or have entirely disappeared. The first two lunules of the four in the anal angle coalesce and form a large conspicuous blue crescent; the other two lunules are normally developed. The dark orange belt is narrowed and clouded with black in the costal part. Under side: slightly darker than normal; the crescent on the hind wings is conspicuously marked. The parts of the facies not mentioned are normal.

It is of interest to note the development of the blue lunules in this variety as compared with other forms in which reversely the costal (apical) lunules are favoured at cost of the anal lunules (*io*-formity, see 'Ent. Record,' pt. 4, 1909, plate vii).

On the 8th of August I bred a variety of *V. io* from wild Hertfordshire larvæ, in which the ocellus of the hind wings is disintegrated into three distinct bright blue lunules (Fig. 2). On the right hind wing a fourth blue spot is marked (as also in many otherwise normal specimens of *io*), and the place of a fifth spot is indicated—thus the possibility of a chain of lunules like in *V. urticæ* is suggested. The normally yellow parts of the fore wings are narrowed and grey in colour; the whole breadth of

the ocellus is suffused with bright metallic blue-violet; under side of hind wings suffused with yellow scales along the veins below the discal cell in the same manner as can be seen in many aberrations of *urticæ*.

AN UNUSUAL PHASE OF VARIATION IN LEPIDOPTERA.



Spilosoma menthastris, ab.

THIS unique aberration of *Spilosoma menthastris* was taken by Mr. Brown (one of the gamekeepers of my brother-in-law, Frank Percy, Esq.) on Ranworth Broad, Burlingham Hall, Norwich, on June 21st, 1909, and sent to me.

JOS. F. GREEN.

West Lodge, Blackheath.

[In the figure of this remarkable specimen it will be noted that, although typical on the right side, aberration in the direction of *ab. walkeri*, Curtis, is strongly exhibited on the left fore wing.—R. S.]



Zygana trifolii, ab.

THE above exceedingly curious insect was reared during the past summer by Mr. Sydney Thorne, of Bournemouth. As regards the right side it is a typical *Zygana trifolii*, but on the left side all the markings are confluent, and thus forms the elongate blotch-like mark characteristic of the uncommon *ab. minoides*, Selys.

Among some specimens from Esher, collected in 1900, in my collection, is a female that, so far as concerns the right fore wing, is typical. On the left fore wing, however, spots 3, 4, 5, are confluent, and there is a red dash from 3 almost effecting a junction with the united basal spots (1, 2). Two other specimens (males) from the same locality and taken in the same year may be mentioned as peculiar. Each of these has a small red dot before spot 4, on the left fore wing; in all other respects these examples are typical.

RICHARD SOUTH.

DESCRIPTIONS OF THREE NEW SPECIES OF CETONIIDÆ FROM THE INDIAN EMPIRE.

BY OLIVER E. JANSON, F.E.S.

Diceros gracilis, n. sp.

Body elongate and narrowed behind, shining black, sides of the thorax with an ill-defined red marginal band more or less dilated behind; elytra with a large pale yellow central patch, pygidium and apical segment of the abdomen red. Head sparsely punctured at the base, a little impressed and obliquely striated on each side between the eyes; clypeus slightly dilated in front, rather coarsely punctured, the side margins raised, the apex slightly rounded and with the margin evenly reflexed. Thorax finely and sparsely punctured, a large transverse impression on each side at the base with coarse horseshoe form punctures. Scutellum with remote fine punctures or almost impunctate. Elytra with eight regular rows of horseshoe form punctures which do not extend to the apex, the sutural row strongest and the two outer rows indistinct in some specimens, the apical part strigose. Pygidium strongly transversely strigose. Under side and legs strigose and coarsely punctured; mesosternal process very long and curved inwardly towards the apex; abdomen very deeply and broadly impressed in the male, convex and more strongly punctured in the female; anterior tibiæ with a strong subapical marginal tooth in both sexes. Length, $12\frac{1}{2}$ – $13\frac{1}{2}$ mm.

Tharrawaddy, Burma, and Maria Basti, Brit. Bhotan (coll. Janson).

The small narrow form, punctured impressions on the thorax and strongly punctured elytra of this species readily distinguish it from *D. cuvera*, Newm., to which it is most nearly allied, and its simple unarmed clypeus at once separates it from *D. childreni*, Westw. The size of the yellow elytral patch varies a little, but is very similar to that in the latter species.

Tæniodera idolica, n. sp.

Black, above dull with short grey pubescence, under side and legs shiny and with longer and denser pubescence. Above with ashy-grey markings disposed as follows: on the head two longitudinal

bands; on the thorax a marginal band on each side from a little before the middle to the basal angles and a large Y-form central mark extending from the anterior angles to the tip of the basal lobe where it dilates into a large round spot; on the scutellum a central stripe dilated at the base; on the elytra two transverse spots at the sides and a broad sutural band, forked and following the margin of the scutellum to the base, dilated before and again behind the middle and continued along the apical margins; on the pygidium a very broad central band. The under side broadly marked with ashy-grey at the sides, the femora with marginal bands of the same colour. Head slightly shiny, densely and coarsely punctured, the clypeus dilated and strongly rounded in front, the apical margin reflexed and broadly and shallowly emarginate. Thorax rounded at the sides, broadest a little before the middle, the side and basal margins slightly raised and shiny, coarsely and closely punctured. Elytra with a distinct median carina and rather indistinct punctured striæ. Pygidium closely but indistinctly punctured. Under side and legs coarsely punctured; mesosternal process short, obtuse, cariniform; abdomen slightly flattened, but not grooved, in the centre; posterior tibiæ very strongly produced, keeled, and with a tuft of long yellow hair on the inner side at the apex. Length, 14 mm.

Maymao, Upper Burma (coll. Janson).

Allied to *T. zebraea*, Fairm. (of which I have a co-type from the author), but smaller, the head more closely punctured, the clypeus broader, more rounded at the sides, and with the apical margin reflexed and less deeply notched, the thorax more narrowed behind, the elytra more truncate at the apex, the under side less closely punctured, the abdomen in the male not impressed, and the posterior tibiæ of a quite different form. The markings are somewhat similar but less extended, the marginal bands on the thorax are not directed inwardly behind, there is no humeral spot on the elytra, and the band on the pygidium is not dilated at the base. The name given is in reference to the idol-like figure of the markings on the elytra.

Teniodera indica, n. sp.

Black or piceous, above opaque with sparse short golden pubescence and pale ochreous or yellowish markings disposed as follows: on the head two longitudinal bands; on the thorax an oblique vitta on each side and a large Y-form central mark; on the scutellum a broad stripe slightly dilated at the base; on the elytra a small spot above the shoulder, two transverse lateral spots, a small mark at the apex of the scutellum, an irregular transverse mark about the middle of the suture, and a large apical mark extending a short way along the suture, where it is more or less dilated; on the pygidium a central spot or vitta. Under side shining, with golden pubescence and broad pale ochreous bands at the sides. Head very coarsely punctured, a smooth longitudinal median carina at the base; clypeus dilated and rounded at the sides, shallowly emarginate at the apex. Thorax broadest before the middle, where it is distinctly broader than

long, moderately lobed and sulcate behind, the entire surface with a very dense coarse punctuation, which becomes confluent and rugose towards the sides, the side margin behind the middle slightly raised and smooth. Elytra strongly costate along the centre, depressed and striated near the suture, punctured at the base and sides, slightly rounded at the apex. Pygidium convex, coarsely strigose and rugose. Under side strigose and with coarse semicircular punctures on the abdomen; mesosternal process narrow and obtuse; anterior tibiae with two strong lateral teeth. In the male the abdomen is slightly impressed, and the posterior tibiae are keeled, slightly curved, and with dense long golden pile on the inner side. The female is less opaque above, and has the Y-form thoracic mark widely interrupted in the middle. Length, 15-17 mm.

Khasia Hills and N. Manipur, Assam (coll. Janson).

Allied to *T. zebraea*, Fairm., but with the clypeus broader, more rounded, and less deeply notched, the thorax much broader, the elytra less rounded at the apex, the markings different, and, in the male, with the abdomen more lightly impressed, and the posterior tibiae of a different form.

CURRENT NOTES.

By G. W. KIRKALDY.

1. MIYAKE, T.: "Description of a New Species of the Genus *Latirostrum*, with Remarks on the Generic Character and the Significance of the Long Palpi," Bull. Coll. Agr. Tokyo, viii. 149-51, 1 fig. (April, 1909). Lepidoptera.
2. ID.: "A Revision of the Arctianæ of Japan," *op. cit.* 153-74, figs. 1-6 (April, 1909). Lepidoptera.
3. JAPHA, A.: "Die Trutzstellung des Abendpfauenauges" (*Smerinthus ocellatus* L.), Zool. Jahrb. Abt. Syst. xvii. 321-8, pl. 12. Coleoptera, Lepidoptera.
4. KOSMINSKY, P.: "Einwirkung äusserer Einflüsse auf Schmetterlinge," *op. cit.* 361-90, pls. 13-7. Lepidoptera.
5. BLUNK, H.: "Färbungsvariation bei *Dytiscus marginalis*, Linn.," Zool. Anz. xxxiv. 337-45 (June 1, 1909). Coleoptera.
6. DAVIS, W. T.: "Owl Pellets and Insects," Journ. New York Ent. Soc. xvii. 49-51 (June, 1909). Coleoptera.
7. LOVELL, J. H.: "The Colour Sense of the Honey Bee—Is Conspicuousness an Advantage to Flowers?" Amer. Nat. xliii. 338-49 (June, 1909). Hymenoptera.
8. EWART, A. J.: "The Negative Phototaxis of Blowfly Larvæ," Victorian Nat. xxiv. 61-2 (July, 1907). Diptera.
9. JACOBSON, E. "Notes on Web-spinning Ants," *op. cit.* 36-8 (June, 1907). Hymenoptera.
10. DAW, R. P.: "On the Origin of Entomological Names," Journ. New York Ent. Soc. xvii. 51-6 (June, 1909).

11. POMONA JOURNAL OF ENTOMOLOGY I.: pp. 1-25, fs. 1-25 (March, 1909).
12. POULTON, E. B.: "Essays on Evolution, 1889-1907," pp. l-lviii and 1-479. (Oxford, 1908.)
13. NEWCOMB, W. W.: "A Summer with *Chrysophanus dorcas*, Kirby," Can. Ent. xli. 221-9 (July 7th, 1909). Lepidoptera.
14. MAXWELL-LEFROY, H.: "Eri or Castor Silk," Agr. J. India, iv. 125-33, pls. 6-13 (April, 1909). Lepidoptera.
15. WALTON, W. R.: "An Illustrated Glossary of Chætotaxy and Anatomical Terms used in Describing Diptera," Ent. News. xx. 307-19, pls. 13-16 (July, 1909).

Miyake (1) describes a new species from Japan of the Noctuid genus *Latirostrum*, and remarks, "Baron Takachiho captured the moth in a forest on Mount Hikosan, one of the highest mountains in Kiushiu. He says the moth was resting on a leaf of a certain tree, with its long palpi extended forwards so as to imitate a spine in a very perfect manner, and he supposes that when it settles on a branch of a tree it may pass unobserved even by keen eyes, showing us the significance of the long palpi of this species." The same author (2) revises the Japanese Aretianæ, enumerating, with synonymy, thirty-two species, with a table of distribution; six species are figured, the larvæ of nine briefly described, and the food-plants of several listed, no less than seven being harboured by mulberry. Three new species are described, the previously known forms having apparently been described at length in Japanese in the extra-reports of the Imperial Agr. Sta. 22 (1906).

Lovell (7) reviews the subject of colour-sense in insects with relation to flowers. His paper is not very amenable to summarisation, but, briefly, his results confirm the usual generally adverse position to Plateau's opinions.

Japha (3) discusses the "defiance-attitude" of *Smerinthus ocellatus*, with a coloured plate. Kosminsky (4) discusses the influence of external conditions on Lepidoptera. Blunk (5) deals with colour variation in *Dytiscus*.

A new entomological periodical has appeared in California (11); the first number deals principally with Aphididæ and Coccidæ.

It is surprising not to have seen a review in the 'Entomologist' of Poulton's collection of Essays on Evolution (12); these are partly reprints of papers read or delivered before various meetings, but also largely new, the greater part being directly or indirectly connected with entomology, the following especially: "Thomas Henry Huxley and the theory of Natural Selection" (pp. 193-219); "Natural Selection the Cause of Mimetic Resemblance and Common Warning Colours" (220-70); "Mimicry and Natural Selection" (271-92); "The Place of Mimicry in Scheme of Defensive Coloration" (293-382); with a

classification and index of the examples of mimicry quoted (383-479). One of the notable mechanical features in the text is the copious index of 85 pp.

British lepidopterists will probably be interested in Newcomb's detailed observations on the habits of a United States *Chrysophanus* (13). Maxwell-Lefroy discusses at some length the Castor Silkworm, *Attacus ricini* (which is probably the domesticated form of *A. cyynthia*). The larvæ differ from all other silk-producing Indian larvæ in that they do not feed on mulberry, but on castor leaves; the cocoon is not closed and is not reel-able in the same way as other kinds. On the other hand, the cocoons do not require to be killed to prevent the egress of the moth, as one end is closed only with converging loops of silk (14).

ON TWO NEW GENERA AND SEVEN SPECIES OF CHALCIDIDÆ (EUCHARINÆ) FROM BORNEO.

By P. CAMERON.

ANCYLOTROPUS, gen. nov.

♂. Antennæ twelve-jointed, the joints elongated, pilose. Parapsidal furrows distinct, complete. Scutellum large, triangular, the apex prolonged into a broad spine, two-thirds of the length of the basal part, keeled down the centre, the apex slightly incised. Thorax rugose. Abdominal petiole long, cylindrical, as long as the rest of the abdomen, flat above, the sides margined. The right mandible with four teeth, the basal not so distinct as the others; the outer tooth less, but dilated at the base. Abdomen projecting upwards. Stigmal branch short, thick. Face raised in the centre, the raised part narrowed into a keel below; the clypeus with a large fovea on either side above. The head is broader than it is long, and is a little wider than the thorax.

In the table of Ashmead (Mem. Cairn. Mus. i. 269) this genus runs to near *Psilogaster*, which has the antennæ eighteen jointed, and the apex of the scutellum is rounded. The form of the scutellum in *Ancylotropus* is pretty much as in *Saccharissa*, but that genus has the antennæ eighteen-jointed.

Ancylotropus cariniscutis, sp. nov.

Head and dilated part of abdomen black, the thorax dark blackish blue, with coppery and violaceous tints, the antennal scape, pedicel, palpi, tegulæ, and legs, except the coxæ, yellowish testaceous, the flagellum of antennæ dark testaceous at the base, the apical joints blackish; wings hyaline, the nervures testaceous. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

Basal two joints of antennæ bare, the rest densely covered with long fuscous pubescence. Face and clypeus smooth, the vertex and front longitudinally striated, the striæ stout and clearly separated. Mesonotum and scutellum somewhat strongly reticulated, the scutellum more widely than the mesonotum; the centre, and, less strongly, the sides of scutellar spine keeled, the space between the keels with a few transverse striæ. Metanotum coarsely irregularly reticulated. Propleuræ coarsely reticulated, the mesopleuræ more finely obliquely reticulated; the metapleuræ strongly regularly reticulated and densely covered with white pubescence. Sides of abdominal petiole with two or three stout longitudinal striæ. The mesopleuræ less densely covered with white pubescence than the metapleuræ. Wings shortly, closely ciliated. The metapleuræ are broadly rounded at the apex.

ELTOLADA, gen. nov.

Antennæ eleven-jointed, simple in the male, the joints elongated, cylindrical, pilose; longer than the body, in female not much longer than the head and thorax united, the basal joint elongated, as long as the following two united. One mandible edentate, the other with a long apical followed by two short teeth. Parapsidal furrows distinct. Scutellum large, almost semicircular, the apex prolonged into a process which is as wide as long at the base, followed by two roundly curved forks. Abdominal petiole as long as the thorax, and longer than the rest of the abdomen in both sexes, narrow, cylindrical, of equal width; the dilated apical part is turned upwards. Marginal and post-marginal vein thickened, the latter half the length of the former and narrowed towards the apex, stigmal vein short, sessile, as long as thick.

The simple, non-flabellate antennæ might ally this genus with *Psilogaster*, which, however, may easily be known from it by the scutellum not being bidentate. The simple antennæ in the male separate it from *Stibula* and *Schizaspidia*; from the latter it may further be known by the very much longer abdominal petiole, and by the thickened marginal and post-marginal nervures, and the very short, thick, stigmal vein.

Eltolada trimaculata, sp. nov.

Head blue, the mandibles and palpi yellowish testaceous, the basal three joints of the antennæ and the apical two testaceous, the apical more rufous in tint than the basal. Thorax yellowish testaceous, a large blue and violaceous mark, almost semicircular, but longer than wide, on the basal half of the central lobe, a smaller oblique one, longer than wide, its base rounded, the apex straight and oblique on the two lateral, a line on the apex, touching the scutellum, a small triangular mark on the apex of the scutellum. Length, 5 mm.

Kuching, Borneo; May (John Hewitt).

Sides of the head, from the base of the ocelli to the middle of the front, longitudinally striated, the striæ strong and clearly separated, the centre, immediately under the antennæ, with three curved transverse striæ. Malar space to near the bottom stoutly obliquely

striated. Clypeus triangular, bordered by wide deep furrows. There are some striæ between the ocelli. Thorax coarsely reticulated, the metanotum more widely than the rest. Mesopleuræ smooth, with a broad band of stout longitudinal striæ at the base. The reticulations on the metapleuræ are long and narrow, and, at the base, are in three rows, the basal having the reticulations longer than the others. There is a crenulated furrow, with stout raised edges, down the centre of the scutellum. The apical forks of the scutellum are straight, obliquely diverging, and are as long as the basal part.

Eltolada leucopoda, sp. nov.

Head and thorax blue, the blue on the mesonotum tinged with green and darker coloured, the blue on the pleuræ slightly tinged with violaceous, the scutellum black, tinged with green. Abdomen black, the ventral surface brown. Antennæ testaceous, tinged slightly with rufous; the legs whitish yellow, the coxæ blackish to near the apex. Scutellum large, the basal part forming a semicircle; the basal part of the spine longer than the apical forks, which are roundly curved, and are for the greater part brownish. Wings hyaline, with a fuscous cloud, longer than wide and rounded at the apex, at the stigma, the apex is faintly clouded, the nervures black. ♂. Length, 4-5 mm.

Kuching, Borneo (John Hewitt, B.A.).

Antennæ densely covered with longish fuscous pubescence. Sides of the face to below the middle obliquely striated; the depressions at the sides of the clypeus large, deep. The face in the centre above with curved, transverse striæ; malar space stoutly closely obliquely striated. Ocellar region longitudinally, the occiput transversely, striated. Thorax, except the centre of mesopleuræ, reticulated; the metathorax more and the mesopleuræ less strongly than the rest, the scutellum not so strongly as the mesonotum. Abdominal petiole longer than the rest of the abdomen.

Schizaspidia cæruleiceps, sp. nov.

Dark green, the head and the dilated part of the abdomen blue, the occiput green, the antennæ and legs testaceous, the femora and hind tibiæ infuscated; wings hyaline, the nervures testaceous. Scutellum larger, longer than it is wide at the base, narrowed towards the apex, which is not quite half the width of the base; the apical forks wide, curved, narrowed towards the apex, which reaches close to the base of the apical fourth of the abdomen; it is longitudinally reticulated, the transverse keels finer than the longitudinal, the reticulations on the apical forks finer and more irregular than on the basal part. Mandibles testaceous. ♂. Length, 4.5 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head smooth, the sides of vertex widely, weakly striated, the malar space finely, irregularly striated. Pro- and mesonotum transversely reticulated, the transverse striæ stronger than the lateral. There is a transverse furrow at the apex of the mesonotum; a deep curved depression at the base of the scutellum. The lower part of the projecting apex of the scutellum reticulated; the metanotum is more

strongly and closely reticulated. Propleuræ with large irregular reticulations; the meso- and metapleuræ more closely and strongly reticulated. Abdominal petiole weakly, irregularly striated; the apical segments brown. Thorax covered with short white pubescence, which is longer on the metanotum.

Eucharis leviceps, sp. nov.

Dark blue, the dilated part of the abdomen almost black; antennal scape yellowish testaceous, the flagellum densely pilose, fuscous, the basal joints testaceous. Mandibles testaceous; palpi pallid yellow. Prothorax smooth. Basal slope of mesonotum closely, rather strongly, transversely striated, the rest closely reticulated, the scutellum more coarsely, irregularly reticulated. Metathorax smooth, the base with a crenulated furrow. Propleuræ and base of mesopleuræ smooth, the raised central part of mesopleuræ closely reticulated. Legs pallid yellow, the femora and the hind coxæ black, the base of the four anterior coxæ infuscated. Wings hyaline, the nervures pallid testaceous. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

The central part of the face is raised, and is bordered by distinct curved furrows.

Eucharis purpureoventris, sp. nov.

Bright blue, the dilated apical part of the abdomen purple-violaceous, the antennal scape, mandibles, palpi, four front legs, and the hind tibiæ and tarsi and trochanters, pallid yellow; the hind coxæ and femora dark blue. Flagellum of antennæ densely pilose, fuscous, darker towards the apex. Wings clear hyaline, the nervures pale. ♂. Length, 3 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head smooth and shining, the centre of the face and the sides of the clypeus margined by deep, wide furrows, the furrows at the face converging, at the clypeus diverging, below. Pro- and mesonotum with scutellum closely reticulated. Metanotum smooth, the centre bordered by wide, converging, crenulated furrows, the centre being thus narrowed towards the apex. Propleuræ smooth, the centre with a curved, weakly crenulated furrow. Mesopleuræ smooth, the centre with a wide furrow, which turns up obliquely at the apex; the base is composed of a large oblique and a smaller oval fovea, the rest is irregularly striated; the apex is bordered by a weakly crenulated furrow, curved and dilated above. Metapleuræ smooth, the furrow shallow, wide, weakly crenulated. Abdominal petiole not much longer than the rest of the abdomen.

Eucharis pallidipes, sp. nov.

Dark blue, the pleuræ with violaceous tints, the abdomen black, the antennal scape, palpi, and legs pallid yellow, the basal half of the femora infuscated; flagellum of antennæ blackish fuscous; wings hyaline, the nervures fuscous. ♂. Length, 3 mm.

Kuching, Borneo (John Hewitt, B.A.).

Front and vertex aciculated, the rest of the head smooth and shining. Mesonotum irregularly longitudinally rugosely punctured. Scutellar depression wide, the middle more finely rugosely punctured than the mesonotum itself, the sides with stout, clearly separated striæ. Scutellum large, broadly rounded, rugosely punctured, the basal slope irregularly longitudinally striated. Metanotum closely, irregularly reticulated. Propleuræ, except at the base, irregularly longitudinally striated. Middle of mesopleuræ reticulated, the upper basal part closely longitudinally striated, this striated part being raised and light blue. Hind coxæ blue, and finely, closely striated. Abdominal petiole about one-quarter longer than the rest of the abdomen.

NOTES AND OBSERVATIONS.

ABRAXAS GROSSULARIATA ab. LACTICOLOR IN WARWICKSHIRE.—As the distribution of varieties in this county seems very little worked, it might be well to record that on July 23rd a specimen of *A. grossulariata* ab. *lacticolor* emerged in my breeding-cage. The specimen, which was unfortunately a cripple in one wing, differed from the example figured in "South" in having the black markings on the costa and fringe slightly less obsolete. The insect was bred from a larva found at Rugby, fed on hawthorn.—P. W. WHITLEY; Brantwood, Halifax.

EUPITHECIA TOGATA GOING OVER TWO SEASONS IN PUPAL STAGE.—I had a similar experience to that of Professor Meldola (*antea*, p. 182) with pupæ of *E. togata*, obtained, I expect, from the same source. Out of twelve pupæ, five emerged last year, and six in the early part of June, 1909. They were exceptionally fine specimens. I had concluded that the pupæ were dried up, as they were exposed to strong sunlight, whenever this somewhat rare phenomenon took place.—G. BERTRAM KERSHAYS; West Wickham, Kent, July 27th, 1909.

SPANISH CHESTNUT AS A FOOD-PLANT OF THECLA QUERCUS.—On May 31st (Whit Monday) of the present year I found a larva of *T. quercus* on a stub of Spanish chestnut. The larva was about three-parts grown and fed up well, in due course turning into a pupa, whence emerged a fine female butterfly on July 21st. I have never heard of this tree as a food-plant of *T. quercus*; in fact, in my experience, very few larvæ seem to take a fancy to it.—GEOFFREY MEADE-WALDO; 17, Douglas Mansions, Cromwell Road, S.W.

REARING CHRYSOPHANUS RUTILUS IN ENGLAND.—With reference to the note on *Chrysophanus dispar* in the 'Entomologist' for July, the following experiment, conducted by Mr. Newnham (since dead, I believe) at Church Stretton, may be of interest. Mr. Newnham procured a large frame, and in this he grew the food-plant of *C. dispar*. He then placed within the frame some larvæ of *C. rutilus*; the imagines resulting were allowed to breed in a moist atmosphere. At the end of two or three years, a form much nearer *dispar* than

rutilus resulted. Unfortunately a severe winter ended the experiment. I can vouch for the truth of this statement, having had it described by Mr. Newnham, who showed me the series of specimens about the year 1898.—RALPH RYLANDS; Highfields, Bidston Road, Birkenhead, July 5th, 1909.

PERONEA VARIEGANA AND ABERRATIONS IN DURHAM.—In 1908, whilst staying at Bishop Auckland, in Durham, during early July, I found a few larvæ of *Peronea variegana* between leaves of a pear-tree growing up the end wall of a house. Among the seven or eight moths reared therefrom, only more or less greyish specimens and one example of ab. *asperana* occurred. About the middle of July last I was able to visit the same town again, and on this occasion secured a nice lot of larvæ of the species from the pear-tree. The majority of these attained the winged state, the bulk of the specimens were of the blackish marked grey form known as *cirrana*, and it is curious to note that the first moth to emerge (Aug. 5th), as well as the last (Aug. 27th), are of this form. The typical form, and also. ab. *asperana*, are well represented, together with modifications of each of those forms and of the *cirrana* form. In addition there were seven beautiful white specimens of ab. *albana*, Westw., four of which emerged on August 12th, two others on the 15th of that month, and one on the 22nd. The original description of *albana* runs as follows:—"Measures 7 lines in expanse; fore wings silky white, with a few white tufts of elevated scales on the disc, the costal margin slightly brunneous, as well as the apical fringe; hind wings pale brown. Closely allied to *P. treueriana*, but that species has the costa destitute of the slender brunneous margin, and the disc has a few black scales scattered about near the tip." (Westw. & Humph. 'Brit. Moths,' ii. 162 (1851).)

I may mention that, although I refer my white specimens to *albana*, they differ from the type, which is in the National Collection, and from the above description, in having the costa of fore wings more distinctly marked with brownish; most of them are rather larger in expanse and the wings appear broader.—RICHARD SOUTH.

THE PERPENDICULAR DISTRIBUTION OF THE PAPILIONIDÆ IN THE HIMALAYAS.—I shall be obliged if any readers of the 'Entomologist' will supply further information respecting the approximate range of altitude of all Papilionides occurring in the North-western Himalayas, in order to fill up some of the gaps in the table on pp. 205-6. The following errata require correcting:—Page 197, line 2, for twenty-five read *seventy-five*. Page 199, line 12, also page 205, line 8, for *P. didoneus* read *P. aidoneus*. Page 205, line 4, for Papilionidæ read Papilioninæ; line 21, for *A. polyctor* read *Sarbaria polyctor*.—W. HARCOURT-BATH; August 16th, 1909.

ENTOMOLOGICAL CLUB.—A meeting was held on July 5th, 1909, at the 'Hand and Spear' Hotel, Weybridge, Mr. G. T. Porritt in the chair. Other members present were Messrs. R. Adkin, Donisthorpe, Rowland-Brown, and Verrall. The additional guests were twelve in number, including two honorary members—Messrs. A. H. Jones and Sich.

CAPTURES AND FIELD REPORTS.

ORANGE VARIETY OF *ZYGÆNA FILIPENDULÆ*.—From some three dozen cocoons of *Z. filipendulæ* collected at Merrow, Surrey, in July, a fine specimen of ab. *aurantia*, Tutt, emerged on August 8th, the spots and hind wings being bright orange, the rest of the wings metallic blue.—E. S. A. BAYNES; 120, Warwick Street, S.W.

SELIDOSEMA ERICETARIA IN SCOTLAND.—In 'The Moths of the British Isles,' I see that the only Scotch record for this moth is the Isle of Arran (1882). I took two male examples at the beginning of this month, on the marshy ground among the hills behind Mallaig, Inverness-shire.—E. S. A. BAYNES.

ANTITHESIA SALICELLA IN WARWICKSHIRE.—We have much pleasure in recording this somewhat local Tortricid moth for Warwickshire. We have taken it to-day (July 26th) beneath an old willow, on the River Avon, near Rugby. Last year we captured a single specimen (again on a willow) at Brandon, Warwick, on July 24th. There is also a specimen in the Collection of the Rugby School Natural History Society, labelled "2nd Aug. '98, N. V. Sidgwick." It is evident, therefore, that the insect is not rare in this county, though hitherto, apparently, it has been unrecorded. Barrett gives no Midland locality for it except Cheshire; but he states that it occurs as far north as Yorkshire and Durham.—P. A. and D. A. J. BUXTON; Chigwell, Essex.

SUGARING A FAILURE.—I visited Cambridgeshire from middle of June to first week in July, and my experience was that moths were entirely absent, owing no doubt to the prevailing cold and wet. Conversing with a well-known collector at Bedford, his testimony coincided with my own experience. A general report would be interesting, so as to give an idea of other records.—E. EVERETT; Letchworth.

ACENTROPUS NIVEUS.—When taking my usual constitutional along the Westcliff front last night, I noticed a small *Acentropus niveus* excitedly spinning around, on the ground, under one of the electric light standards. I stooped to box it, and found that the cause of all the fuss, excitement, and endless gyrations was the presence of a female, which sex I had not previously seen, alive or dead, in this district.—F. G. WHITTLE; 7, Marine Avenue, Southend, August 16th, 1909.

ABUNDANCE OF *NOLA CUCULLATELLA* AND *PERONEA VARIEGANA*.—On July 20th, 1909, I walked through Richmond Park (Surrey) and noticed that *Nola cucullatella*, which is usually common there, was in greater abundance than in former years. The specimens were also of good size and nearly all in remarkably good condition. Every whitethorn of any size had several specimens at rest on the trunk or on the larger branches. I counted the moths on only one tree, and these amounted to ten. Among the Nolas were a few *Gelechia vulgella*, some *Swammerdamia litarea*, and many worn *Blastodacna hellerella* (*Laverna atra*). Another common species which is attached

to whitethorn has also been, I think, more abundant this year than usual, or, one ought perhaps to say, is more abundant, as I believe *Peronea (Acalla) variegana*, the species I allude to, hibernates in the imago state. I have seen a great many sitting on whitethorn leaves in the hedges in Chiswick and Brentford. The parti-coloured and dark forms were equally common, but the browner variety was much scarcer.—ALFRED SICH.

PLUSIA MONETA IN NORTH LINCOLNSHIRE.—I took a fresh specimen of *Plusia moneta* on July 18th, 1909, in a garden at Limber, in North Lincolnshire.—E. A. COCKAYNE; 16, Cambridge Square, W.

CELASTRINA ARGIOLUS IN MIDDLESEX, &c.—In my previous note (*antea*, p. 186) I mentioned the fact that I had never seen an autumn example of this species here in all the years I have met with it common or otherwise in the spring. Yesterday (August 22nd), preparatory to a big shower, the sky was clear, and I noticed a female *C. argiolus* at rest on a flower-cluster of hydrangea; and a male flying rapidly over the lawn. With regard to the Pierids, reported by me as so common this year in Middlesex in May, and in Essex by Mr. Frohawk (*antea*, p. 213), I may add that they are even more abundant in this neighbourhood in the second generation, while on August 21st, on the beautiful Chiltern Hills between Kimble and Princes Risboro', they were flying in hundreds, *P. brassicæ* undoubtedly predominating. A fresh and numerous brood of *P. napi* was also much in evidence, while the scabious, thistles, and hawk-weeds—this season in great luxuriance—were visited by the following:—*Pamphila comma*, *Thymelicus flavus* (worn), *Chrysophanus phleas*, *Polyommatus corydon* (males just emerging, very late), *P. alexis* (one very fine female ab. = *cærulea-angulata*, Tutt), *P. astrarche* (fresh, very small), *Gonopteryx rhamni* (fine, just out), *Argynnis aglaia* and *A. adippe* (both in rags), *Vanessa io*, *Pyrameis atalanta*; *Epinephele jurtina*; *Aphantopus hyperanthus* (still in fair condition), and *Cænonympha pamphilus*; all, except the "skippers" and the "whites," under normal size. On the flower-heads *Charaas graminis* was represented by single examples; and on a windy, bleak day in the middle of June I also observed, at the same spot, great numbers of *Adscita geryon* on the helianthemum, and not a few *Parasemia plantaginis*; butterflies, however, being conspicuous by their absence at that date.—H. ROWLAND-BROWN; Harrow Weald, Middlesex.

PHRYXUS (DEILEPHILA) LIVORNICA AT EXETER.—I wish to record taking here, on July 27th, a dead male specimen of *P. livornica*, under an electric light standard in High Street. It was in fairly good condition.—F. POPE; 11, Portland Street, Newtown, Exeter.

CURIOUS PLACE CHOSEN BY *TRIPHENA PRONUBA* FOR OVIPOSITING.—I have frequently noticed batches of ova deposited on the tarred stop-netting round our tennis-courts, but have never been able to actually see what insect chose so unpromising a place for the purpose. Recently, however, I was fortunate enough to observe a moth in the act of oviposition, and after allowing it to deposit about

fifty ova captured it, and found it to be the common Yellow Underwing. Wondering what would become of the young larvæ when they found themselves on so peculiar a "food-plant," I examined another batch of ova which had been laid some time previously, and found that after slowly eating so much of the egg-shell as was not attached to the tarred string, the larva spun a fine thread of silk and floated gently to the ground, presumably there to continue its life among the grass. It would be interesting to learn whether any other observers have noticed the moth doing the same thing in other districts.—HARRY ELTRINGHAM; South Shields.

[On July 23rd last I noticed a number of the ova of *Mamestra persicariæ* on some black thread hanging on the branches of a plum-tree in the garden. (The thread, it may be mentioned, had been put over the tree to protect the blossom from bird attack in the spring.) In one case the eggs were arranged in beautifully neat order, side by side, all down a loose end for about four inches of its length: in appearance this was not unlike a string of tiny beads. A shorter row of eggs was laid on a length of thread that was still stretched from one twig to another. This was cut off for examination, and was found to have some sixty eggs upon it; of these I kept about half. The larvæ hatched a few days later, and at first ate the foliage of the plum, but when supplied also with knotgrass and other weeds they seemed to lose their taste for plum. Larvæ also hatched out from the ova left on the thread in the open, and those that have so far escaped their enemies are no doubt feeding upon various plants in the garden. At all events I have failed to detect any on the plum-tree, although those from the eggs I kept are now (Aug. 27th) nearly full-grown.—R. S.]

ACRONYCTA ACERIS LARVA FEEDING ON LABURNUM. — *Acronycta aceris*, L. is not uncommon in this district and, though it occurs on sycamore, its favourite food-plant here appears to be horse-chestnut. Last autumn (1908) I took a very young Acronyctid larva off laburnum, which, as Mr. South suggested when I mentioned it to him, turned out to be that of *A. aceris*. Laburnum seems to be a strange food-plant for this species which, however, may be more of a general feeder than is usually supposed. When a species is exceptionally abundant it sometimes takes to unusual food-plants, but *A. aceris* was not more frequent than usual last season. I may also mention that from the early stage of the larva when I took it, and from the way in which it ate the laburnum leaves supplied to it, I have no doubt that the egg was laid by the parent on the laburnum-tree. I failed however to find any further larvæ of this species on the tree.—ALFRED SICH; Corney House, Chiswick, Aug. 18th, 1909.

LEPIDOPTERA IN EAST SUSSEX.—For the past four years it has been my good fortune to spend a portion of the month of August at the "ancient town" of Rye. It is a place known chiefly to artists and golfers, and has apparently received little attention from entomologists. Yet it is perhaps better situated as a locality for the insect-hunter than any other spot on the south-east coast. The town itself rises sharply above the river Rother, and is separated from the sea by a mile or more of salterns, the coast being bordered

by a long stretch of sandhills. Inland the country consists of the river valley—a rush-covered plain divided roughly into fields by ditches thick with reeds—and of well-wooded hills. Between these hills and the marshes lies the rock on which the town stands. Thus there is in its immediate neighbourhood a great variety of country, each district rich in the species peculiar to it. In addition, the town, which is very brightly lighted, serves as a beacon both to the moths which haunt the lowlands and to those bred on the wooded slopes. August does not usually appear to be a profitable month for entomology. Large numbers of common insects are about, but the choicer species have mostly disappeared. During my previous visits, apart from some sugaring on the coast, where in 1906 *Laphygma exigua* was common, and where I took *Leucania littoralis* in addition to *Agrotis velligera*, *A. tritici*, *Hadena chenopodii*, *C. cytherea*, *A. citraria*, and many others, and from light work among the reeds, I did very little. During the present year, however, things have been very much busier. Although I was only there from Aug. 1st to 16th, and could not devote much time to entomology, my list of captures contains many insects which were wholly unexpected. Probably the cold weather of June and July caused many species to postpone their emergence until late. The exceptional heat of early August must account for the heavy “rise” of moths which took place then. It seems most unlikely that the season has favoured the production of second broods; although there has been an abundance of green food, this would be more than counteracted by the low temperature of June and July. Delay in leaving the pupal stage seems to be the probable cause of the appearance of certain species in my list.

During the first part of my visit I spent most of my energies on the marshy salterns below the town. Here I found a place, overgrown with yellow *Galium*, in which *Mesotype virgata*, *Cledeobia angustalis*, and a few other species were swarming. Of the former the males were most numerous and in best condition on Aug. 3rd, while on Aug. 5th females were everywhere, and scarcely a male could be taken. On several nights I worked the reedy ditches and small reed-beds which are found all over the salterns, and the results, if not very striking, were at least not disappointing. The following species were taken:—*Nudaria senex* (common on Aug. 3rd; one on Aug. 9th), *Odonestes potatoaria*, *Leucania straminea* (a few each night; it was not always easy for me to distinguish this species from *L. impura*, which was common, but the under side of *straminea* is a good guide when the insect is boxed), *Senta ulvæ* (one, very worn, on Aug. 3rd), *Luperina testacea*, *Miana furuncula*, *Noctua umbrosa*, *N. rubi*, *Acidalia emutaria* (not uncommon), *Schænobius gigantellus*, *Chilo phragmitellus*, and *S. forficellus*. Though I did not myself take *S. chrysorrhæa*, a nice specimen was given to me which had been taken on Aug. 13th by Mr. J. S. Carter at Lydd. It was at light that the best results were obtained. Large numbers of insects came regularly into the house, and the few nights on which I searched the town lamps were richly productive. I will give the complete list of captures, adding particulars where such appear interesting:—*Sarothripa revayana*, *Hylophila bicolorana* (one on Aug. 13th, not a perfect specimen), *Lithosia lurideola*, *L. griseola*, *Arctia caia*, *Cilix*

glaucata, *Pterostoma palpina* (Aug. 13th), *Pheosia dictæoides* (two fine specimens Aug. 13th and 15th), *Notodonta dromedarius* (a beautiful specimen Aug. 15th), *Cerura furcula* (a fine specimen Aug. 13th), *Bryophila perla* (the commonest species at light), *B. glandifera* (a nice uniformly green form Aug. 12th, apparently not common, as searching the walls produced only *B. perla*), *Acronycta psi*, *A. rumicis* (a fine specimen Aug. 11th), *Nonagria geminipuncta* (one at light in the town on Aug. 15th; this seems unusual as there is no reed-bed within half a mile of the lamp at which it was taken; it is not uncommon in the neighbourhood), *Hydræcia paludis*, *Apamea didyma*, *Xylophasia monoglypha*, *Cerigo cytherea*, *Agrotis puta*, *A. nigricans* (this is, I believe, an uncommon insect in Sussex, one was taken on Aug. 11th), *A. tritici*, *Triphæna ianthina*, *T. pronuba*, *Calymnia trapezina*, *C. diffinis* (two on Aug. 13th), *Phorodesma cytisaria* (Aug. 13th), *C. affinis*, *Hadena chenopodii*, *Crocallis elingvaria*, *Boarmia rhomboidaria*, *Acidalia rusticata* (Aug. 13th and 14th), *A. bisetata*, *A. virgularia*, *A. aversata*, *A. imitaria*, *Thamnonoma vauaria*, *Lobophora viretata* (at light and on walls, Aug. 13th), *Eupithecia oblongata*, *E. assimidata*, *E. coronata*, and *Melanippe fluctuata*; also several species of the commoner Pyralids and Crambi.

Such is the list. If it does not contain anything very remarkable, the occurrence of certain of the species in August at all is peculiar, and an interesting example of the effect which a sudden rise of temperature after a cold spell may be expected to produce. I regret very much that I did not have time to try sugaring on the coast; but from my experience and that of many others this year has not been favourable for sugar, and consequently I preferred other methods of work.

I may perhaps mention in conclusion that Rye, excellent as it is in itself, is within easy reach of other famous localities. Abbot's Wood, the Downs and the country round Ashford are all readily accessible. My only excursion, however, during the present year was to Folkestone, where I spent a glorious though somewhat torrid day upon the chalk. My success was not phenomenal. *Lycæna bellargus*, which by the end of the month makes the slopes a wonder of glancing colour, was not yet out, but *Melanargia galatea*, *Argynnis aglaia*, *Lycæna corydon*, *Adopæa thaumas* (linea), and *Argiades sylvanus* were all common. Of moths the following were captured:—*Leucania conigera*, *Miana furuncula*, *P. ænea*, *Gnophos obscurata* (a nice form approaching *ab. fasciata*), *Acidalia ornata*, *Ematurga atomaria*, *Aspilates gilvaria*, *Coremia ferrugata*, and *Ortholitha bipunctaria*.—E. C. RAVEN; 7, Canning Street, Liverpool.

RECENT LITERATURE.

Plant Galls of Great Britain: a Native Study Handbook. By EDWARD T. CONNOLD, F.Z.S., F.E.S. With 354 illustrations. Pp. i-xii, 1-292. London: Adlard & Son. 1909.

IN December, 1908, we had the pleasure of calling attention to Mr. Connold's 'British Oak Galls.' What we said of that work

equally applies to the present handy and inexpensive little volume. The larger book, however, deals specially with galls of the oak, but the one under notice treats of all kinds and conditions of plant galls, the work of Aphides, Diptera, Hymenoptera, Coleoptera, Lepidoptera, Eriophyidæ, Anguillulidæ, Fungi, &c.

The excellent illustrations, mainly from photographs, are not only of great value in the identification of galls when met with, but if any particular gall is wanted, a study of the picture of that gall will add considerably to the chance of finding it.

In the opening chapters much information about galls and their producers is condensed, but clearly presented. There are useful lists of Host-plants (English and Latin names), so that if the plant is known, the nature of the gall thereon is, in most cases, easily ascertained.

We cordially commend this book to all who desire to know something authoritative about Plant Galls.

The Scaly-Winged. By R. B. HENDERSON, M.A., Assistant Master at Rugby School. Pp. i-xii, 1-115, 22 illustrations in the text. London: Christophers. 1909.

IN the preparation of this brief introduction to the study of moths and butterflies the author had in view the requirements of Rugbeians who wish to qualify for entering the entomological section of the school Natural History Society.

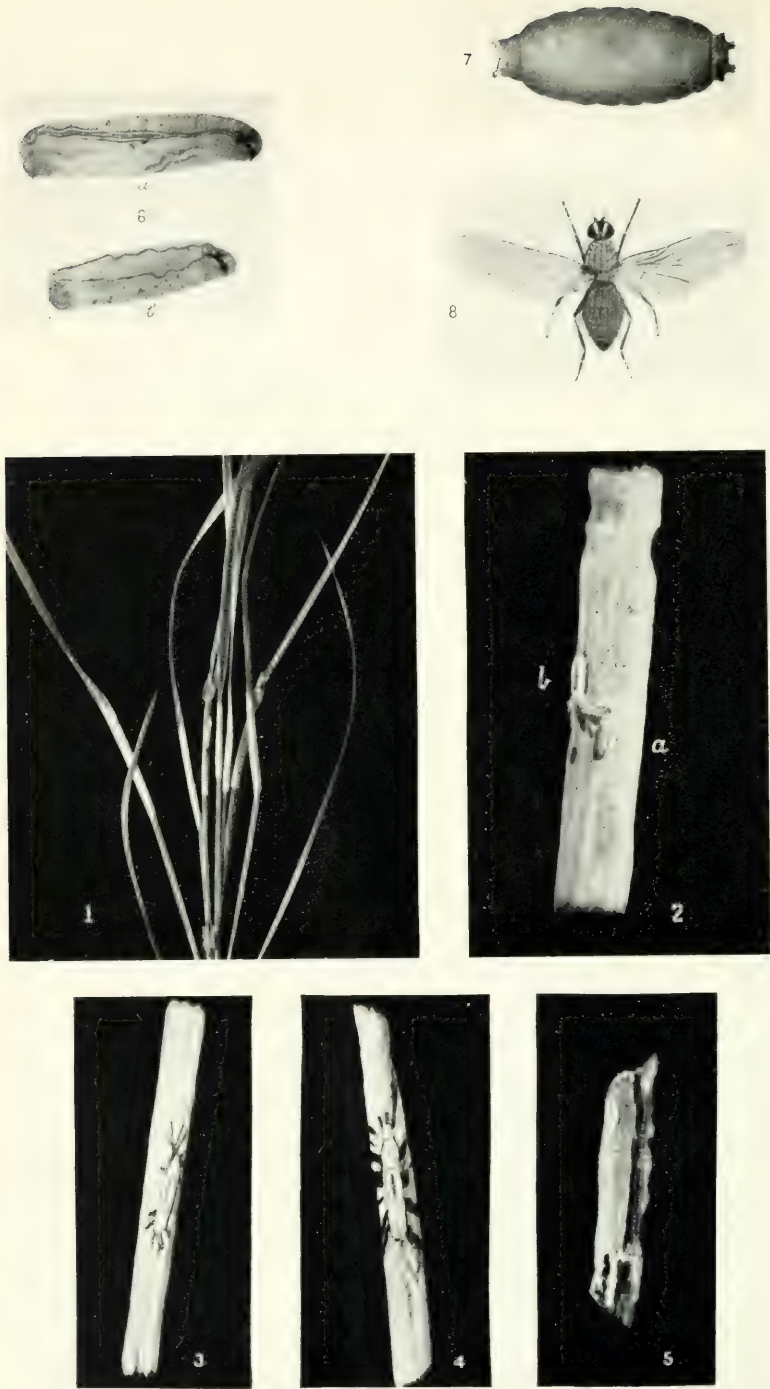
Among the subjects discussed are: Classification of Organisms; the Four Phases of Lepidoptera; Difference between Butterflies and Moths; Bionomics. The student who assimilates all that is set down under these heads will have acquired a good groundwork of entomological knowledge.

Transactions of the Carlisle Natural History Society. Vol. i. Carlisle: James Beeby & Sons. 1909.

WE are glad to note that this local Society, established only some fifteen years ago, and with but a slender list of members for some time subsequently, has progressed so well that it is now in a position to issue a volume of its 'Transactions.' The publication as a whole is of considerable merit, and contains some interesting papers. Among those more directly of interest to the entomologist are the following:—"The Fauna of Cumberland, in relation to its Physical Geography," by Frank H. Day, F.E.S. (pp.63-74); "The Butterflies of Cumberland," by George B. Routledge, F.E.S. (pp. 98-113); "The Coleoptera of Cumberland," Part I, by Frank H. Day, F.E.S. (pp. 122-150).

Illustrated Guide to the Trees and Flowers of England and Wales. By H. G. JAMESON, M.A. Pp. i-xi, 1-136. London: Simpkin, Marshall & Co., Limited. 1909.

THE object of this book is to assist the nature-lover to name trees and flowers by means of a "key," with the addition of reduced drawings of leaves and blossoms in the margin of the text.



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SOME POINTS IN THE LIFE-HISTORY OF *ANTHOMYIA SPRETA*, MEIG.

BY W. J. LUCAS, B.A., F.E.S.

(PLATE VI.)

IN the early summer there may not infrequently be seen a curious white fungus which engirdles the culm of certain grasses for nearly an inch of its length (pl. vi, fig. 1). This is parasitic on the grass, causing injury to it by checking its growth above the part affected by the fungus. A glance at the figure shews that the parasite and its host, the grass, bear no little similarity to a miniature bullrush, and this resemblance, we may assume, suggested the name *Epichloë typhina*, Tul., for the fungus.

To get rid of this fungus is not an easy matter for the agriculturist, but fortunately he has somewhat of an ally in a small dipteron, *Anthomyia spreta*, Meig.* This fly lays its eggs on the surface of the fungus. They are somewhat cylindrical pale bodies, one of which may be seen unhatched on fig. 2*a* magnified about six times. When it hatches, the egg splits along the side attached to the fungus, and the egg-shell does not fall away, but remains where it was first laid. An egg-shell may be seen at fig. 2*b* a little above and to the left of the unhatched egg. When they enter the world the little larvæ find beneath them an immediate supply of suitable food, on which they literally make incursions, traces of which may be seen below the egg-shell.

As the larva (fig. 6*a*, *b*) grows, the egg-shell does not properly cover it, and it builds a waxy tunnel with the egg-shell on its surface, and within this it shelters when not making incursions into its food. In consequence of this the egg-shell, which was cylindrical at first, now has its two broken edges separated from one another. The upper surface falls in as it becomes approximately flat, and then a ridge in the shape of a long ellipse is formed surrounding the depression. This is very well shewn in fig. 4. The traces of the incursions made by the larva to obtain food are also very clear in this figure, and in the preceding one

* The first and fairly full account of the life-history of this fly is given by M. le Docteur Giraud in the 'Annales de la Soc. Ent. de France,' 1872, p. 503.

also (fig. 3), where the tunnel is inhabited by a larva of smaller size. In fig. 5 is depicted the tunnel of a large (if not full-grown) larva, the scale of magnification being the same as that of figs. 3 and 4.

Partly grown larvæ are shewn in fig. 6, *a* and *b*. Like so many dipterous larvæ they are simple maggots, means of extended locomotion and so forth being unnecessary, since they are surrounded by a good supply of suitable food. When full-fed the larvæ fall to the ground, and form around themselves a reddish-brown puparium between 3 and 4 mm. long (fig. 7), which is again very characteristic of certain groups of the Diptera. From this puparium emerges in the following spring (though there is probably a partial autumn brood sometimes) a little blackish fly (fig. 8), in general appearance not unlike a small house-fly, though smaller, for it is but some 9 mm. in expanse of wing.

EXPLANATION OF PLATE.

Fig. 1. The fungus, *Epichloë typhina*, *in situ*, on culms of grass. Fig. 2, *a*. Unhatched egg of *Anthomyia spreta*; *b*. Egg-shell of *A. spreta* ($\times 6$). Fig. 3. Egg-shell, tunnel, and tracks of larva of *A. spreta* ($\times 4\frac{1}{2}$). Fig. 4. Egg-shell at a later stage ($\times 4\frac{1}{2}$). Fig. 5. Egg-shell and tunnel of a large larva ($\times 4\frac{1}{2}$). Fig. 6, *b*. Larva of *A. spreta*; *a*. larger larva of *A. spreta*, photographed from microscope slides prepared by Dr. T. A. Chapman ($\times 6$). Fig. 7. Puparium of *A. spreta*, drawn from living or recently dead specimens ($\times 9$). Fig. 8. Imago of *A. spreta*, drawn from dead specimens ($\times 4\frac{1}{2}$).

NOTES ON DRAGONFLY PARASITES (LARVAL WATER-MITES).

BY F. W. & H. CAMPION.

THE presence of parasitic Arachnida has been detected upon insects representing each of the seven great orders. As an example of Hymenoptera attacked in this way, we may mention a European sawfly (*Tenthredo maura*) in the National Collection, to which Mr. W. F. Kirby has kindly drawn our attention. The Acari found parasitic upon ants and bees are so numerous, both in species and in number of individuals, that quite a large literature exists upon the subject. More than one collector has informed us that mite-attacked Lepidoptera are not infrequently met with. Among Diptera, Mr. Charles D. Soar* has figured a specimen of *Cenia obscura*, Mg., with a larval Hydrachnid wedged between the thorax and abdomen. Among Coleoptera, the same author mentions several species of *Dytiscus* which serve as hosts, and figures an example of *D. marginalis* with numerous mites on its ventral surface, and with some even on one of its

* See his paper "Notes and Observations on the Life-history of Fresh-water Mites," in Journal Quekett Micro. Club, 1906, pp. 359-370, and plates 26-30.

legs. All known species of Acari belonging to the genus *Canestrinia*, Berlese, are found upon insects, and mostly upon Coleoptera; numerous Gamasidæ, when in the immature stages, are found wholly or chiefly upon Coleoptera. Prof. C. V. Riley has published an interesting account ('American Naturalist,' xii. p. 139, 1878) of his researches into the life-history of the North American locust-mite, to which he gives the name *Trombidium locustarum*. Speaking of the newly-hatched larvæ, he says: "These little six-legged specks crawl upon the locusts and fasten to them, mostly at the base of the wings or along their principal veins." He adds: "That they are often so numerous as to weaken and kill their victim, reports clearly prove." Most aquatic Rhynchota are subject to the attacks of water-mites, and Prof. Riley says that over five hundred have sometimes been counted on a single specimen of *Zaitha* (*Belostoma*) *fluminea*, Say, a large American species. Coming to the Neuroptera, we may cite a female scorpionfly (*Panorpa germanica*) taken by ourselves in Epping Forest, and having a mite located on the under side of the right hind wing.

It must, however, always be remembered that the word "parasitic" is used in different senses by various writers, and that the meaning of the word as used by most biologists is wider in its signification than that attached to it by the popular idea. It is necessary to remember this when dealing with the Acari, as so many of that group of creatures, particularly in the immature stages, seek only conveyance from the host on which they are found, and not nourishment; the parasitism being temporary and apparently for the purpose of the distribution of the species of mites: this is chiefly confined to terrestrial Acari, as far as is at present known. There are numerous other variations in the nature of the relations of the so-called Acarine parasite to the host upon which it is found.

Although water-mites attach themselves so freely to many kinds of aquatic insects, we have not yet met with any instance of a nymphal dragonfly being attacked by them. We are acquainted with cases in which Acari have attacked imaginal dragonflies belonging to the sub-families Libellulinæ, Gomphinæ, and Agrioninæ. Among the Libellulinæ, *Sympetrum meridionale* is a notorious instance: indeed, McLachlan wrote of it that "its liability to have the well-known red Acari attached to the wings (sometimes in enormous numbers) is so marked as to be almost a specific character of the insect itself, few specimens being entirely free from them" (Ent. Mo. Mag. xx. p. 253, 1884). Thirteen examples of this species taken casually in France were exhibited by Mr. McLachlan at a meeting of the Entomological Society of London. Only one of them had escaped attack, but the remaining twelve carried between them no fewer than four hundred and eighty-one parasites. Single specimens had as many as

seventy-three, ninety-six, or even one hundred and eleven of them. "They were firmly fixed on the nervures towards, and at, the base of the wing, and almost (but not quite) invariably on the under side, and whatever might be the number on any particular dragonfly it was always divided nearly symmetrically on the two sides of the insect, those much infested having a very pretty appearance, from the wings appearing as if spotted with blood-red" (Ent. Mo. Mag. xiii. p. 95, 1876). Two excellent plates accompany a paper by M. Krendovsky on the economy of the larvæ of Hydrachnidæ published in a Russian periodical (Trud. Charkov Univ., 1878, Tom. xii, pp. 221-286). Figure 7 on Plate 1 shows a specimen of *S. meridionale* having numerous mites, coloured red, distributed in a remarkably symmetrical manner along the principal nervures of the wings. Another figure (8) on the same plate represents, again in colour, three of the mites on a large scale. These mites are described as the six-legged larvæ of *Arrhenurus papillator* (Müll.), but, as will appear later, this determination is by no means certain.

Krendovsky also states that Hydrachnid larvæ occur on the sternum of *S. flaveolum*. This is the only case which has come to our knowledge in which larvæ have been found on the body of an Anisopterid dragonfly. Some of the specimens of *S. fons-colombii* taken by Mr. C. A. Briggs in Surrey in 1892 were much affected by a dark carmine-coloured *Acarus*; on one of the dragonflies he counted as many as eighty-five parasites. Mr. Briggs asks, "Do these Acari extract any colouring matter from their host? They exactly match the colouring of the nervures, and one that I squeezed gave out a similar coloured fluid" (Ent. Mo. Mag., ss. iii. p. 194, 1892). *S. striolatum* has also been mentioned in this connection, but apparently in error for *S. meridionale*.

An example among the Gomphinæ is afforded by a female of *Platygomphus dolabratus* from India in the British Museum, which has a red parasite on the left hind wing.

But it is among the Agrioninæ that Acari are met with most abundantly, and our own collection furnishes examples of six species which are infested to a greater or smaller extent. Those species are *Erythromma naias*, *Pyrrosoma nymphula*, *Ischnura elegans*, *Agrion pulchellum*, *A. puella*, and *Enallagma cyathigerum*. We have also noticed an immature female of *P. tenellum* in the Stephens cabinet carrying a single mite on the sternum. Furthermore, Krendovsky includes *Lestes* in the category of mite-attacked dragonflies. In all the cases which have come under our personal observation, the parasites are attached to the under side of the thorax or abdomen, or both (but never to the wings), sometimes in twos and threes, sometimes covering the entire surface affected. In life they appear to the unaided eye as globose bodies less than a millimetre in diameter when fully

grown, colourless at first, but usually reddish or reddish-brown in later life. Unless they are placed immediately in a preservative fluid, however, they quickly lose both their colour and rotundity. We have always noticed that mites occur most plentifully when their Zygopterid hosts are but newly on the wing, and it would seem that dragonflies rid themselves of their parasites to a great extent as the season advances. We have, however, a mite-attacked male of *E. cyathigerum* taken at the Black Pond, Surrey, as late as September 3rd. It would also seem that some larvæ leave the egg much sooner than do others, for we have met with teneral specimens of *P. nymphula* early in May and teneral examples of *E. cyathigerum* towards the end of July carrying larvæ in the same colourless and ungrown condition. Although, as we have seen, locusts are weakened and even killed by the attacks of parasites, there is no evidence before us of injury done to Odonata in this way.

The occasional presence of mites upon Odonata was known so long ago as 1778, when De Geer figured and described red parasites from the thorax of a small dragonfly under the name *Acarus libellulæ*, and identified them with the *A. gymnopteronum* of Linnæus. By these and other old writers they were regarded as adult forms, but it was subsequently recognised that these six-legged creatures were larval forms which in later life acquired the fourth pair of legs proper to Arachnida. As we have seen, Krendovsky called some larvæ from the wings of an Anisopterid dragonfly *Arrhenurus papillator*, and, following him, Mr. Soar considered parasites from the bodies of such dragonflies as *Agrion pulchellum* and *A. puella* to be no other than *Arrhenurus globator*. We have made several enquiries with a view to clearing up the doubts which still exist respecting the affinities of dragonfly parasites with other larval Hydrachnidæ, but we have failed to elicit any definite information, owing to these parasitic stages being so little understood. Three species of Zygopterides with mites attached to their bodies were submitted for examination to the eminent Hydrachnologist, Herr F. Koenike, of Bremen. He has kindly informed us that the parasites belong to different species of Hydrachnidæ, but to the same genus. At present he is unable to say with certainty into which genus the larvæ fall, but in any case he does not agree with those authors who have referred them to *Arrhenurus*. Attempts made by Herr Koenike to rear dragonfly parasites have not been successful, but he has bred the real larva of *A. globator*, and he is satisfied that the parasites in question have nothing whatever to do with *Arrhenurus* larvæ.

It was suggested by McLachlan that the parasites may attain their position on the body or wings of a dragonfly by climbing up the legs of their host while it is at rest. This suggestion, in itself a likely one, is rendered the more probable by the fact that in our experience of Zygopterides the mites

appear on the sternum of their host earlier than on the abdomen. Moreover, all the Odonata carrying Acari on their wings which have come under our notice belong to the Anisopterid division, whereas all the Zygopterid dragonflies which we have known to be infested have borne their parasites upon the inferior surface of the thorax or abdomen, or both, but never on the wings. Also, as we have seen in the case of the Anisopterid *Sympetrum meridionale*, mites attach themselves to the lower surface of the wings more readily than to the upper surface. These circumstances will be better understood when it is remembered that Anisopterid dragonflies rest with their wings spread out horizontally, while Zygopterid dragonflies in a state of repose generally hold their wings erect. And the frequency with which the smaller dragonflies are attacked is no doubt accounted for by the fact that they habitually cling to rushes and other aquatic vegetation when not in flight, while the larger species usually take shelter among the branches of trees, high above the level of the water.

Our cordial thanks are due to Mr. Albert D. Michael both for directing our correspondence with specialists and for perusing these notes in draft; to Mr. Francis P. Marchant for helping with the Russian literature consulted; and to Mr. W. F. Kirby for kind and ready assistance rendered on this and many other occasions.

NOTE.—Since the foregoing was written, I have had the advantage of discussing this matter with Dr. F. Ris during an interview with him at Brussels. Although *Sympetrum meridionale* and *S. fonscolombii* are the only Odonata he has met with carrying Acari on the wings, he has found several imaginal Anisopterids—such as *Cordulia aenea*, *Libellula quadrimaculata*, and species of *Leucorrhinia*—having Acari on the thorax and abdomen. Furthermore, he told me that a large proportion of the nymphs collected by him in Switzerland have been infested with Acarine parasites, and, in the cases of *Sympetrum sanguineum* and *Enallagma cyathigerum*, he has actually witnessed the mites passing from the nymphal skin on to the skin of the imago while the emergence of the dragonfly has been taking place.—H. C.

33, Maude Terrace, Walthamstow: Sept. 6th, 1909.

SIX WEEKS AMONGST HUNGARIAN BUTTERFLIES.*

By W. G. SHELDON, F.E.S.

WITH so much of Eastern Europe at present closed to the lepidopterist who values his safe return home, Hungary offers one of the chief centres for observing certain butterflies, the area of distribution of which does not extend so far west as the Alps; and for this reason most of us get there sooner or later.

* Among other comparatively recent papers on Hungarian butterflies may be mentioned two published in this Journal:—"A Fortnight's Collecting at Budapest," by W. E. Nicholson, F.E.S. (vol. xxv. pp. 191-193, 210-212); "Two Seasons among the Butterflies of Hungary and Austria," by Margaret E. Fountaine, F.E.S. (vol. xxxi. pp. 281-89).

With the companion of several previous expeditions, Mr. E. F. S. Tylecote, I reached Budapest on May 29th last. The next day the net was unfurled on the Schwabenberg, or Sváb-hegy as it is called in Magyar, a hill several miles west of Budapest, best reached by taking the electric tram from the west end of the Franz Josef Bridge over the Danube as far as the Varos Major terminus of the rack and pinion railway, by which one then travels to the station of Sváb-hegy itself.

Sváb-hegy is a large rounded hill, rising to perhaps six or eight hundred feet above the surrounding country, fast becoming a suburb of Budapest, and already covered in parts with villas. But it has still considerable stretches of uncultivated land, consisting of grassy slopes, rough ground thickly covered with a growth of herbs and flowers, and stretches of wood, chiefly oak, with open glades in places; the subsoil is calcareous.

On leaving the station one follows the line which terminates at the top of the hill further on by taking the road on the left side, running parallel to it for a few hundred yards, until a flight of wooden steps is seen leading to the left up the hillside, at the top of which is a patch of oak scrub of several acres in extent, with some nice glades running through and amongst it. Here were plenty of butterflies, amongst them *Cænonympha iphis* and *C. arcania* being abundant; the latter a fine, large, bright form; the former with the ocelli much larger than in French or Swiss examples; *Melitea phœbe* was frequent, and the slow flight of *Leucophasia sinapis* was unmistakable. A large Hesperiid flying plentifully rapidly to and fro was netted, and proved to be *H. carthami*; various species of the Lycenidæ were seen, including *Lycæna hylas*, *L. bellargus*, *L. icarus*, and *Rusticus argus* (*ægon*), which was abundant.

Proceeding further I came to a large open space thickly covered with flowering plants, almost to the exclusion of grass, and including the fine purple *Salvia pratensis* (a rare British plant), various species of *vicia*, and numerous composites. The wealth of insect life here was quite unusual, and, in addition to butterflies, one came across many moths found in Britain, including *Lithostege griseata*, *Agrophila sulphuralis*, *Scoria lineata*, *Heliothis dipsacea*, and *Acontia luctuosa*; an assemblage which it would be difficult to meet with in our islands in one field. With them occurred in abundance the butterfly which was the chief object of my visit to Sváb-hegy—the lively little black and white skipper *Pyrgus orbifer*, which reaches at Budapest almost its western limit. My predecessors, who had visited Hungary in early June, had invariably found this species *passé*. On this day it was considerably past its best, and I had to use much selection to get a good series. I should give the middle of May as the best time; its habits of flight are similar to *Hesperia malvæ*, which was equally common with it; on the wing

one has difficulty in separating the two species, except that *P. orbifer* is somewhat browner in colour; a few examples also of *Hesperia alveus* were flitting about with the other two species.

The hill culminates in a bare ridge, commanding a fine view of the plain and the river Danube; here freshly emerged *Parnassius mnemosyne* were not infrequent, these being distinctly larger than my Swiss examples, and having the black blotches in both sexes smaller, darker, and better defined. An odd Chrysophanid turned out to be a female of *C. thersamon*, a new species to me, and also a good example of *Melitæa trivia* was netted, but not recognised until I got home.

We paid further visits to Sváb-hegy on the 3rd, 5th and 7th of June, and were rewarded each day by interesting species, including the fine form of *Polyommatus orion* var. *ornata*, not uncommon in the oak glades amongst the sedum plants; *Melitæa trivia* was not infrequent, but very local, some of the specimens being already past their best. But by hard work I managed to get together eighteen or twenty good examples. *M. trivia* is easily recognised in flight from its *confrères*, for it is the swiftest species of the genus I have seen; and this habit, with its small size, makes it difficult sometimes to follow with the eye. From its nearest relation *M. didyma*, the lesser size and darker colour serve to distinguish *M. trivia* at once, whilst from the only species of its size flying at the same date, *M. aurelia*, it is at once separated by the more rapid flight. In one field *M. aurelia* was abundant. I used to think that specimens of this species, or those that I could not separate from it, taken at high altitudes in Switzerland, flying with *M. parthenie* var. *varia*, were only forms of the latter, and I do not know that this opinion has been much changed since; but certainly *M. aurelia* seems distinct enough in Hungary from any other species of the genus, the specimens being strictly typical and showing no approach to *M. parthenie* or to any other species; and being at once distinguished from *M. athalia*, which was flying at Budapest in early June, by size and general appearance. *M. didyma* was just emerging; the examples were brightly coloured and of good size. I was much surprised to net, in a glade at the top of the steps before-mentioned, a fine example of *Neptis lucilla*, a species I had not expected to come across at Budapest.

I had been provided by my friend Mr. A. H. Jones, who most kindly placed at my disposal the results of his successful visit to Hungary two years previously, a letter of introduction to Herr Aigner of the Budapest National Museum. Accordingly we called there on May 31st, but learnt that Herr Aigner had been unable to follow his duties at the Museum for a considerable time; and I am sure all who are interested in entomology, especially those who have visited Hungary, will greatly regret that his long illness terminated fatally in June.

On making known that we wished to see the Museum collection of Hungarian butterflies, we were most kindly welcomed by Dr. Soos, and introduced to Professor Schmidt, who was in charge of the insect department. To this gentleman we are deeply indebted for his great kindness to us during our stay at Budapest, for during that time he placed himself and his knowledge entirely at our disposal, acquainting us with the best localities for the species we wished to get, and accompanying us there, interpreting, and assisting us in every possible manner. This assistance was exceptionally valuable, for Budapest is a most difficult district to work, primarily because all the best localities are at some distance, and also because there does not appear to exist a suitable map of the environs.

On the 1st of June we accompanied Professor Schmidt to Kamaraerdo, our chief object being to obtain series of the two local species of *Chrysophanus* found in the Danube marshes, *C. dispar* var. *rutilus*, and *C. thersamon*. To my note on the former species (see 'Entomologist,' *antea*, pp. 219-220) I will only add that on this day I captured twelve males and three females, most of them in perfect condition. Of *C. thersamon* I obtained eleven males and one female, all in good order. *C. thersamon*, unlike *C. var. rutilus*, frequents flowers, chiefly those of *Salvia pratensis*, settling on them and exposing its brilliant upper side to catch the warmth of the sun. Great quantities of *Aporia crataegi* were flying everywhere, and some of the assemblies congregated on the damp patches on the road were enormous, and must have consisted of several hundred individuals.

The country collected over was a valley extending from Kamaraerdo station to the village of Promontor, some three miles distant, and from which electric trams conveyed us to the foot of the Franz Josef Bridge at Budapest; as a matter of fact, after our first journey we travelled by tram, which we found much quicker and more convenient than by taking the train.

On a subsequent visit to this locality (June 4th), Professor Schmidt being unable to accompany us, Dr. Soos most kindly acted as our chaperon. This was very desirable and probably saved us some unpleasantness, for the butterflies were on cultivated ground, the owners of which I understand have been known to object strongly to strangers wandering amongst their crops, but the Museum authorities can go anywhere. On this occasion *Chrysophanus* var. *rutilus* was abundant, and my bag of twenty-three examples included half a dozen females. I also captured a fair example of *Thais polyxena*, and saw a few small larvæ of that species on the food-plant, *Aristolochia clematitis*. *Argynnis niobe* var. *eris* was just coming out. *Chrysophanus thersamon* was by this date practically over, and all the examples observed were hopeless as cabinet specimens.

On the 6th of June we again visited the marsh; but the day

was a bad one with little sun, and beyond a few more *Chrysophanus* var. *rutilus* we did not observe anything worthy of note.

On the 8th of June we took the early morning train to Szada, a residence of Baron Vécsez, who had invited us to spend the day there. We were met at the station by a carriage, in which we drove several miles to the house, where we were received with characteristic Hungarian kindness and hospitality, and enjoyed a most delightful visit. In the morning we were conducted by Baron Vécsez through a tract of country consisting chiefly of vineyards and orchards, in which many of the bare-footed and picturesquely clad peasantry of both sexes were working, to some fine woods crowning rising ground; here we were pleased to come across *Chrysophanus alciphron* in large numbers and in splendid condition. The day unfortunately was cloudy with rain, and we had only a few minutes sun, but during that time managed to secure about thirty specimens and also some *Melitæa trivia* and *Argynnis adippe* var. *cleodoxa*. I found at rest a female of *Rusticus argyronomon* (*argus*), which is certainly the finest form I have ever seen of that species, and has a very pronounced and brilliant orange band on the under side of the hind wings.

In returning we were shown some banks covered with *Aristolochia clematitis*, on which the larvæ of *Thais polyxena* were feeding in enormous numbers; it would not have been difficult, I believe, to collect 1000 larvæ or even more, but I contented myself with about five dozen full-grown examples, which have since produced over fifty fine pupæ. In the afternoon we looked through Baron Vécsez's collection of Hungarian lepidoptera, which contained some interesting specimens.

Our last day in the neighbourhood of Budapest (June 12th) was devoted to the famous locality of Pészer. Before visiting Hungary I had a very indefinite idea where this place was situated; for beyond stating that you took the train from Budapest to Dabas, a two hours' journey, all the accounts I could find of those that had visited Pészer were silent, and as Baedeker does not mention Dabas and Bradshaw knows it not, I had not the remotest idea of the direction in which it lay or how to get there. It may therefore not be out of place to state that the station in the railway guide is named Alsó Dabas, which means Lower Dabas, and is situated about thirty miles south-east of Budapest, on the railway to Lajosmizse.

Leaving Budapest by the early morning train we arrived on the ground about 10.30 a.m. I can quite understand the enthusiasm which this wood produces on all who visit it. Pészer is indeed a wonderful locality for Diurni, which were far more plentiful than I saw elsewhere in Hungary; in fact, I have not seen anywhere in Europe a locality in which butterflies were in greater abundance. Various causes have probably

produced this luxuriance of individuals. Pészer is one of the few spots which has probably always been uncultivated, a remnant of the old Pannonian Forest which once covered the whole of the country; the soil is of a warm sandy nature, and the vegetation luxuriant and varied.

Immediately on unfolding our nets we were confronted with the difficulty, amidst such riches, of not knowing what to choose. Swarms of *Brenthis hecate*, in perfect condition, hovered over the grass, and *B. hecate* is not an easy species to obtain. A series of it was therefore one of our first objects; they were very different to my Spanish examples, with much smaller blotches on the upper side, and with the chestnut blotches and the markings generally on the under side of the hind wings much more brilliant. The fine *Chrysophanus alciphron* was almost equally numerous, flitting about in the clearings and settling on the flowers. A series of two dozen was soon secured, including nine or ten females, and then one found that numerous *Theclas* were flying round and settling on the oak bushes, presently identified as *Thecla acaciæ*, the first time I had seen it alive, and *T. ilicis*; both of them in the finest condition. *Melitea trivia* was abundant, but going over, and good specimens required considerable selection. Bright yellow *Coliads* flew wildly here and there; several I caught were certainly only *Colias edusa*, but one I missed looked very like *C. myrmidone*, and was the only example of the species I came across in Hungary, if it was it. To the Skippers flitting briskly to and fro I had not much time to devote; but *Hesperia carthami* was abundant, also *Pamphila sylvanus*, and either *P. linea* or *P. lineola*, or both; *Carcharodus lavateræ* was also not infrequent.

Naturally we made a careful search for *Melanargia* var. *swarovius*, but with not much anticipation of success, for this species has of late years become very rare at Pészer—the cumulative bag for the last three years consisting, so far as I could learn, of only seven examples, and our search was unsuccessful. I may here mention that Professor Schmidt informed me on my return to Budapest in July that *M. var. swarovius* has not been seen this year.

Intending visitors to Pészer should note that it is Crown property, and that a permit, difficult to obtain, has this year for the first time been required; and they should before going enquire at the Budapest Museum, the authorities of which can, and no doubt would, do their best to assist.

On my return to Budapest on July 2nd I searched carefully the capsules of *Colutea arborescens* at Farkas Volgy for larvæ of *Lycæna iolas*, which I was informed should there be plentiful, but without success; probably the bad season was responsible for the failure.

(To be continued.)

CONTRIBUTIONS TO A KNOWLEDGE OF ETHIOPIAN ECONOMIC ENTOMOLOGY.*

By W. L. DISTANT.

THE genus *Sahlbergella*, Hagl. (Fam. Capsidæ) is now known by two species, both of which are injurious to the Cocoa-tree (*Theobroma*, sp.)

Genus SAHLBERGELLA.

Sahlbergella, Hagl. Öfv. Vet.-Ak. Förh. 1895, p. 469; Reut. Zool. Anz. xxxi. p. 102 (1907).

Deimatostages, Kuhlgl. Zool. Anz. xxx. p. 29 (1906).

Gen. ? nov. Grah. Journ. Econ. Biol. iii. p. 113 (1898).

Type *S. singularis*, Hagl.

SAHLBERGELLA SINGULARIS.

Sahlbergella singularis, Hagl. Öfv. Vet.-Ak. Förh. 1895, p. 469; Kirk, Wien. Ent. Zeit. xxii. p. 13, fig. 1 (1903); Reut. Zool. Anz. xxxi. 102 (1907).

Deimatostages contumax, Kuhlgl. Zool. Anz. xxx. p. 31, figs. 1-4 (1906).

Gen. ? nov. *longicornis*, Grah. Journ. Econ. Biol. iii. p. 113, pl. viii. figs. 1-2 (1908).

In S. Ashanti, according to Dr. Graham (*supra*), "very large numbers of these insects were found on the diseased trees, and not on the healthy ones. They appear to damage the trees by perforating the bark and so producing 'gumming.'"

Sahlbergella theobroma, sp. n.

Black; posterior lateral margins to pronotum, base and costal margin to corium, irregular segmental spots to connexivum, lateral areas of meso- and metasterna and disk of abdomen beneath fuscous or brownish-ochraceous; antennæ incrassate, basal joint considerably thickened and shorter than fourth joint, second gradually thickened from base, globosely incrassate at apex and about as long as head and pronotum together, second and third joints very stout and pyriform, third longer than fourth; pronotum slightly but distinctly gibbous behind the anterior pronotal angles, rugose, with scattered tubercles; scutellum prominently raised, rugose and tuberculate, the apex robustly posteriorly produced and slightly curved downward; membrane opaque, considerably passing the abdominal apex; tibiæ robust and strongly shortly pilose, the tarsi stramineous. Long incl. tegm. $8\frac{1}{2}$ to 10 millim.

Hab. Gold Coast: Fancheneko (Dudgeon—type Brit. Mus.)

Allied to *S. singularis*, Hagl., but differing in the black coloration, the shorter second joint of the antennæ, rugose pronotum and scutellum, and the more apically recurved scutellum.

* A previous communication as regards cotton pests will be found in 'Entomologist,' 1906, p. 269.

Mr. Dudgeon calls the species the "Cocoa-bark Sapper," and it is thus referred to in his 'Fourth Report on Agricultural and Forest Products of the Gold Coast to Secretary of State Colonies, 1909.'

A NEW GENUS AND SPECIES OF ORNEODIDÆ (LEP.).

BY T. BAINBRIGGE FLETCHER, R.N., F.E.S.

MICROSCHISMUS, nov. gen.

(μικρός, short: σχισμός, a cleft.)

Maxillary palpi absent. Labial palpi very long, at least twice length of head, densely scaled. Fore wing cleft into six segments beyond two-fifths; hind wing cleft into six segments within half.

Type.—*M. fortis*, Wlsm. (T.E.S. 1881, 284-5, t. xiii. f. 49).

The above forms the fourth described genus of the Orneodidæ, which may now be tabulated generically as follows:—

- | | | |
|-----|--|------------------------|
| 1 { | Hind wing cleft into seven segments | <i>Triscædecia</i> . |
| | Hind wing cleft into six segments | 2. |
| 2 { | Fore wing cleft from at least one-third | <i>Orneodes</i> . |
| | Fore wing cleft from about half only | 3. |
| 3 { | Labial palpi at least twice length of head | <i>Microschismus</i> . |
| | Labial palpi not exceeding length of head | <i>Pelia</i> . |

Besides the above-quoted type the genus *Microschismus* contains the following new species:—

Microschismus antennatus, n. sp.

♂. Exp. 16 mm. Labial palpi very long (about thrice length of head), down-curved, densely scaled so that proportions of joints are not visible but third joint is apparently very short, fuscous. Maxillary palpi absent. Haustellum feebly developed. Head roughly scaled, fuscous. Antennæ fuscous, each joint emitting a pair of bristles slightly longer than length of joint on which they arise. Thorax fuscous. Abdomen fuscous, suffused with blackish; anal tuft pale fuscous. Legs fuscous grey; posterior tibiæ with two pairs of moderate, unequal spurs. Fore wing cleft into six segments; first cleft from about two-thirds, second from slightly beyond half, third from about two-thirds, fifth from about half, fourth from halfway between third and fifth; segments linear: light greyish-brown with a very slight yellow tinge minutely irrorated with dark-fuscous dots, especially evident on basal third: bases of third, fourth, and fifth clefts outlined in dark-fuscous, forming a conspicuous line running obliquely inwards across the wing; first segment crossed by two indistinct dark-fuscous bands at about one-third and two-thirds of its length; remaining segments cut by a moderate dark-fuscous band at about three-fifths of their lengths, preceded and followed by slightly paler spaces; apices of all segments with a blackish dot. Cilia

light-fuscous mixed with darker: on costa suffused with dark-fuscous to about half, with dark-fuscous dots just before and beyond two-thirds; on all segments darker opposite dark bands. Hind wing cleft into six segments: first cleft from within half, second from about a quarter, third from beneath base of first cleft, fourth from about one-third, fifth from about one-sixth; segments linear: light fuscous irrorated with darker. Cilia light-fuscous, very long on dorsal margin.

Type ♂ in Oxford University Museum. It is labelled "Orange River Colony, near Bothaville, Valsch River, five miles from Vaal, Blockhouse No. 74, captured April to mid-June, 1902, and presented 1902 by E. N. Bennett." It also bears a manuscript label, "May 1st, Blockhouse." I am indebted to Professor E. B. Poulton for the opportunity of examining this specimen.

M. antennatus differs from *M. fortis* in its smaller size and more dingy coloration, but is easily separated in the male sex by the antennæ, which are only very shortly ciliated in the type (male) of *fortis* which I have been able to examine through the kind courtesy of Lord Walsingham.

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

BY CLAUDE MORLEY, F.Z.S., F.E.S.

THE extremely injurious nature of the Homoptera included in this family is perhaps better appreciated in warmer climates than in Britain, where the amount of damage annually done to our fruit-trees, &c., by these insects is by no means at present fully recognized. When this is the case it will be more clearly seen to what a very great extent the Hymenopterous parasites which destroy them are our friends than we are at present inclined to allow. Many of our leading entomologists, I have no hesitation in saying, are entirely ignorant that Coccids are attacked by the Parasitica at all; and since so little is published upon the subject in my friend Mr. Newstead's admirable 'Monograph of the Coccidæ of the British Isles' (Ray Soc. 1900 et 1902), no apology is, I think, needed for bringing forward in as succinct a form as possible what is known of this fascinating subject. I am greatly indebted to Mr. Newstead for assistance in the Hemipterous synonymy, and to Ashmead's paper "On the Genera of the Chalcid Flies belonging to the Subfamily Encyrtinæ" (Proc. U. S. Nat. Museum, 1900, pp. 323-412) for the elucidation of at least one of the main groups of these beneficial insects.

Extra-British hosts are denoted by an asterisk.

1. *Aspidiotus*.

From unidentified members of this genus Howard ('Revision of the Aphelinæ of North America,' 1895, p. 21) bred *Perissopterus pulchellus*, and (*lib. cit.* p. 42) *Ablerus clisiocampæ*, Ashm., which latter had been originally raised from a Lepidopteron. Dalla Torre says that *Aphelinus annulicornis*, Ratz., has also been bred from this genus, though Ratzeburg (*Ichn. d. Forst.* iii. 195) simply gives it as preying upon some "*Coccus*."

2. *Aspidiotus perniciosus*, Comst.*

Howard (*loc. cit.* 27) tells us that *Aphelinus fuscipennis* preys on this species, and Ashmead also represents *Rhopoideus citrinus*, How., as destroying it in California.

3. *Aspidiotus ancylus*, Putn.*

Both *Prospalta aurantii* and *Phycus variicornis* are named by Howard (*l. c.* 41 et 43) from specimens bred from this species.

4. *Aspidiotus abietis*, Schr.*

Many males and one female of *Coccobius circumscriptus*, Ratzeburg, were bred by him (*Ichn. d. Forst.* iii. 195) from *Coccus pini*, together with his *C. luteus* and single male *C. inconspicuus* (*l. c.* 196 et 210). *Aspidiotus pini*, Comst., is given as the host of *Prospalta aurantii*, How. (*Revis.* 41), and by Gaulle (*Cat. Hym. France*, 106) of *Aphelinus agriope*, Walk.

5. *Aspidiotus ostreæformis*, Curt.

The synonymous *A. tilia*, Behé., is said by Ratzeburg (*l. c.* ii. 148, iii. 189 et 192) to have produced *Encyrtus dendripennis* and *E. hirsutus*, very possibly also *E. longicornis*; the first is now synonymised with *Habrolepis zetterstedtii*, Westw., and the last with *Ericydnus longicornis*, Dalm. Gaulle (*Cat.* 106) adds *Azotus marchali*, How., and *Archenomus bicolor*, How., to its parasites, and Ashmead (p. 409) says the cosmopolitan *Arrhenophagus chionaspidis*, Aur., attacks *Diaspis ostreæformis*, Sign.

6. *Aspidiotus hederæ*, Vall.

This is destroyed by *Prospalta aurantii*, Howard (*Revis.* 41), and, under its better-known name, *A. nerii*, Behé., Tyler Townsend bred four examples of *Signiphora aspidiotii*, Ashm. (p. 412) from it in Mexico in November, 1894; Ashmead gives (p. 411) his *S. mexicana* and (p. 409) *Arrhenophagus chionopsidis*, Aur., as attacking it, and Gaulle (*Cat.* 106) *Aspidiotiphagus citrinus*, Crawford.

7. *Aspidiotus uvæ*, Comst.*

Howard describes ('Insect Life,' 1894, p. 6) his *Prospalta murtfeldtii* from this species.

8. *Aspidiotus zonatus*, Frauenf.

Under the name *Maskellia zonata*, Green, Ashmead records this species as the host of *Anagyrus greenii*, How., from Ceylon (p. 354), and *A. quercicola*, Bché. (probably the *A. quercus* of Signoret), is given by Dr. Giraud (Ann. Soc. France, 1877, p. 421 et 424) as sustaining *Iiabrolepis dalmani*, Westw., and—almost certainly in error—*Callimome coccorum*, Gir. (quoted by Gaulle, 100). Cf. also Howard, Proc. U. S. Nat. Mus. 1896, p. 639.

9. *Aspidiotus corticalis*, Riley MS.*

From a species so named by Ashmead, Howard (Descr. of N. American Chalcid. 1885, p. 13) instances *Encyrtus ensifer*, which is placed by the former (p. 383) in the genus *Coccid-encyrtus*.

10. *Aspidiotus cydoniæ*, Comst.*

His Floridan *Signiphora flavopalliata* is instanced as preying upon this species by Ashmead (p. 411).

11. *Chrysomphalus aurantii*, Mask.

This *Aspidiotus* is recorded, together with its var. *citrinus*, Coquil., as having been attacked by *Aspidiotiphagus citrinus* by Howard (Revis. Aphel. N. Am. p. 31); by *Coccophagus lunulatus*, How. ('Insect Life,' 1894, p. 232); by *Aphycus immaculatus*, How. (l. c. p. 236) in California; and the above var. by *Signiphora occidentalis*, How. (l. c. p. 234) from the same locality.

12. *Chrysomphalus ficus*, Ashm.

Like the last species, this is said by Howard (l. c.) to be attacked by *Aspidiotiphagus citrinus*.

13. *Howardia biclavis*, Comst.

Aphelinus theæ is described by Cameron (Manchester Mem. 1891, p. 183) from the synonymous *Aspidiotus theæ*, Green. Cf. also Indian Museum Notes, 1894, p. 132.

14. *Odonaspis secreta*, Ckll.*

From this species, under the genus *Aspidiotus*, Ashmead in 1900 (p. 404) records *Homalopoda cristata*, but I fail to follow Dalla Torre (Cat. Hym. v. 240), since this association is not given in Ashmead's original description.

15. *Fiorinia saposomæ*, Green.*

The cosmopolitan *Arrhenophagus chionaspidis*, Aur., has been bred by Howard from this species (Ashm. 1900, p. 409, &c.).

16. DIASPIS.

In his Revis. Aphel., Howard records his *Aphelinus diaspidis*

from an uncertain species—rendered “*Diaste*” by D. T.—of this genus.

17. *Diaspis rosæ*, Behé.

This has been often parasitised: by *Aphelinus diaspidis*, How. (Revis. p. 26); by *Aspidiotiphagus citrinus*, How. (l. c. p. 31); by *Phænodiscus* (*Encyrtus*) *ceneus*, Dalm., which was bred from it in Austria by Mayr (Verh. z.-b. Ges. 1875, p. 758); by *Aphycus brunneus*, How. (Descr. N. A. Chal. p. 17); by *Arrhenophagus chionaspidis*, Aur. (Ent. Tidsk. 1888, p. 146); and by *Coccobius diaspidis*, Ashm. (1900, p. 408), at Washington. The synonymous *Aulacaspis* (*Aspidiotus*) *rosæ* is said by Ratzeburg (Ichn. d. Forst. iii. 196) to have been bred by Bouché, and to have produced *Coccobius notatus*; Gaulle (Cat. 26) quotes Cameron (Brit. Phyt. Hym. iii. 233) in saying that the Cynipid *Allotria erythrothorax*, Htg., preys upon it. Newstead does not determine the *Encyrtus* (Mon. Brit. Cocc. i. 31) which causes the female to swell and the skin to become “highly chitinised.”

18. *Diaspis carueli*, Targ.

This is one of the four hosts given by Howard (Revis. p. 25) for *Chalcis* (*Aphelinus*) *mytilaspidis*, Baron.

19. *Aulacaspis pentagona*, Targ.

Like *A. rosæ* above, this species is given by Howard (Revis. p. 31) as attacked by *Aspidiotiphagus citrinus*.

20. *Chionaspis eleagni*, Green.*

C. eleagni is a host of *Physcus variicornis*, according to Howard (Revis. p. 43).

21. *Chionaspis salicis*, Linn.

The Tridymid, *Tritypus areolatus*, is said by Ratz. (Ichn. iii. 227) to have been bred by Hr. Nordlinger from a *Coccus* on *Salix aurita*, from which the parasite emerged through a lateral hole. *Arrhenophagus chionaspidis* is said by Aurivillius (Ent. Tidsk. 1888, p. 146) to have emerged from this species (quoted by Ashm. p. 409), and Gaulle gives (Cat. 100) *Habrolepis zetterstedti*, Westw., as also attacking it. From a species of Coccid on willow, but unnamed, Ashmead says (p. 393) that *Microterys bolus*, Walk., has been bred at Hudson's Bay.

22. *Chionaspis graminis*, Green.*

From this species Howard (Proc. U. S. Nat. Mus. 1896, p. 637) records his *Encyrtus chionaspidis*, from Ceylon (placed in the genus *Adelencyrtus* by Ashm. p. 402), as well as his Proctotrypid *Anthemus chionaspidis* (l. c. p. 643).

(To be continued.)

NOTES AND OBSERVATIONS.

THE HABITAT OF ARGYNNIS LAODICE.—The Hon. N. Charles Rothschild informs me that he has recently found another locality for *Argynnis laodice*, in the Réz Mountains near Cséhtelek, in the Bihar Comitatus, Hungary. He found this species at a lower elevation than before, frequenting a damp situation at the edge of a wood where *Eupatorium cannabinum* (hemp agrimony) grows, the flowers of which were attractive to the butterflies, this making the third locality, but the species appears rare in the district. In the 'Societas Entomologica,' xxiv., nos. 4–5, is a very favourable review by M. von Gillmer of the life-history of *A. laodice*, which I published in the March number of the 'Entomologist.' This gentleman refers to the distribution of this species; from which we now learn that the most westerly limit for *laodice* is Massow, near Stettin, Pomerania, which is $12\frac{1}{2}^{\circ}$ east of Greenwich. In my paper I mentioned that Cséhtelek in Hungary was probably the most westerly point where *laodice* occurred. Respecting the hatching of the egg of this butterfly Von Gillmer mentions that a few eggs out of several which had been subjected to warmth hatched in the autumn. This of course applies to most, if not all, eggs and cannot be considered as a proof that the eggs would hatch at all in the autumn under natural conditions. All the eggs I had under observation were kept in a cool place, and all hatched during the latter part of February.—F. W. FROHAWK.

A SPECIES OF THE NOCTUIDÆ NEW TO SCIENCE.—On July 24th last, Mr. Esson, of Aberdeen, sent for identification a noctuid moth that he had taken, at sugar, on a fir tree, twelve days earlier in the month. As the specimen could not be referred to any species with which I was acquainted, it was submitted to Sir George F. Hampson at the Natural History Museum. At first Sir George was inclined to consider the novelty referable to the N. American genus *Morrisonia*, Grote, but after further examination he decided that a new genus would have to be founded for its reception. This matter, as well as naming and describing the specimen, has been left in his hands. In general appearance, it may be noted, the moth suggests a pale reddish grey aberration of *Lycophotia (Agrotis) ripæ*; but it has hairy eyes, a prominent thoracic crest, and well-defined tufts on the abdomen; it cannot, therefore, be a member of the Agrotinæ. I am very pleased to add that the Hon. N. Charles Rothschild acquired this interesting specimen and has generously presented it to the National Collection.—RICHARD SOUTH.

PLECOPTERA, NEUROPTERA AND TRICHOPTERA FROM THE PYRÉNÉES ORIENTALES.—Dr. T. A. Chapman kindly passed on to me the insects belonging to these orders which he took at Amelie-les-Bains, April 6th–21st, 1909, and at Vernet-les-Bains, April 24th to May 9th, 1909. They were:—* *Teniopteryx seticornis*, Klap., Vernet. *Nemoura*, apparently of the group *marginata*, two females, one from Amelie, the other from Vernet. *Chrysopa aspersa*, Vernet. *Hemerobius subnebulosus*, Amelie. * *Panorpa meridionalis*, Vernet. *Hydropsyche pellucidula*, Amelie [also from Bagnial-sur-Mer]. *Philopotamus montanus*, Amelie and Vernet. * *Rhyacophila persimilis*, Amelie. * *R. tristis*,

Vernet. Those with * are not British.—W. J. LUCAS; Kingston-on-Thames.

RAPHIDIA MACULICOLLIS (NEUROPTERA).—In connection with my note on this snake-fly (*antea*, p. 129), I may note that I have received a pupa from Dr. David Sharp, which he took at Braemore in Scotland in June of the present year. This one is a female, and an interesting point about it is that its long ovipositor is folded back and lies closely pressed to the dorsal surface of the abdomen.—W. J. LUCAS; Kingston-on-Thames.

LONGEVITY OF EPINEPHELE IANIRA.—I believe it is generally considered that the Satyridæ are usually short-lived butterflies, therefore it may be worth recording that a freshly emerged female *E. ianira* I captured *in coitu* on July 2nd last lived in captivity until Aug. 28th, making fifty-eight days.—F. W. FROHAWK.

THE INFLUENCE OF TEMPERATURE ON THE HATCHING OF LEPIDOPTEROUS EGGS.—As an example of the influence temperature has on the development and hatching of eggs of Lepidoptera, the following is a good instance. On May 30th last a *Pieris brassicæ* deposited a batch of forty-one eggs during warm weather, but on June 2nd the temperature suddenly fell many degrees, and cold, wet weather set in and continued so for the next fortnight; consequently, the eggs did not hatch until June 16th, remaining in the egg state seventeen days. At mid-day on August 10th, during fine and very warm weather, I watched three *P. brassicæ* depositing; in all, five batches of eggs were laid. All these hatched on August 15th quite early in the morning, the egg state lasting only four and a half days, due to the weather remaining exceptionally warm throughout, thus making a difference of twelve and a half days in the time of hatching.—F. W. FROHAWK.

GYNANDROUS ABRAXAS GROSSULARIATA ab. VARLEYATA.—Of the only two specimens of wild *Abraxas varleyata* I bred this year, the produce of seven hundred collected pupæ, one has both the left-side wings male, *i. e.* with the usual white rays characteristic of the sex, but the right-side wings female, *i. e.* without white rays, as is usual in that sex. Apparently it is a gynandrous specimen.—Geo. T. PORRITT, Ehn Lea, Huddersfield, September 4th, 1909.

CAPTURES AND FIELD REPORTS.

SUGAR A FAILURE IN JUNE AND JULY.—Mr. Everett (*antea*, p. 235) notes the scarcity of moths during the months of June and July in Cambs. My experience has been similar. I have "treacled" night after night without a single moth visiting the trees. This could hardly have been due to bad weather, as I caught a good number at "light" in these months, and treacle paid well from the middle of August to the beginning of September (I took about fifty on twelve trees on August 26th), although the weather has been almost as bad as in June and July. I think that as flowers have been abundant this season, in spite of the bad weather, the moths may have found them more attractive than artificial sweets.—H. P. JONES; Westwood, Woodlands Road, Gt. Shelford, Cambs.

NOTES FROM SIDMOUTH.—I was pleased when at Weston Beach, near Sidmouth, on August 4th last to see a few examples of that now very local butterfly *Pararge aegeria*. *Colias edusa* was there, too, but not in any numbers. *Adopæa actæon* occurred, but not at all freely, as can be judged from the fact that it took me two hours to get a dozen specimens, all of which were males, for the most part in only fair condition. *Pyrausta punicealis* was common amongst the thyme near the base of the cliffs.—F. G. WHITTLE; 7, Marine Avenue, Southend, September 7th, 1909.

ABRAXAS GROSSULARIATA ab. LACTICOLOR.—On July 29th I took a perfect specimen of *A. grossulariata* ab. *lacticolor* Raynor, as figured on plate 104 in 'Moths of the British Isles' (second series), and I thought this occurrence might be sufficiently interesting to report.—P. H. HARVEY; 9, Church Street, Warwick, August 27th, 1909.

EARLY APPEARANCE OF TRIPHLENA PRONUBA.—Whilst sugaring on the 24th of April of this year for a female *munda*, although already rather late for that insect, I boxed a freshly emerged example of *T. pronuba*. Is not this an exceptionally early date for this species? Probably the mild spell in February may account for their early emergence.—R. T. BAUMANN; "Glendale," 70, Station Road, Chingford, Essex.

ABUNDANCE OF VANESSA IO.—The sudden appearance of *Vanessa io* in such numbers as it is at the present time is, I think, worthy of record after so many years of comparative scarcity. In South-east Essex it is in greater abundance than I have seen it since the "seventies." I hear it is very common in many places, and it would be interesting to learn if it is equally abundant throughout the country.—F. W. FROHAWK.

VANESSA ANTIOPA IN KENT.—Mr. Siegfried Sassoon captured a specimen of *V. antiopa* on September 3rd last behind a blind of a skylight in his house at Paddock Wood, Kent. It is in fair condition, with cream-coloured margins; the blue submarginal spots are smaller than usual.—F. W. F.

NOTE ON NONAGRIA GEMINIPUNCTA.—While working for pupæ of this species at Lewes on the 31st July last, I cut one reed containing no fewer than nine pupæ. It is by no means uncommon to find two or three on one reed, but so large a number as nine is certainly more or less of a record. Can any of your correspondents go one better?—HUGH J. VINALL; Torbay, Park Road, Lewes.

SPILOSOMA LUBRICIPEDA var. ZATIMA IN WARWICKSHIRE.—About the middle of June last I had the good fortune to take, in the town street, a very nice specimen of the *zatima* form of *S. lubricipeda*. It was kept alive for a day or two in the hope of finding a typical female and so obtain a pairing if possible. In this, however, I was not successful.—C. BAKER; 25, Long Street, Atherstone.

DAPHNIS NERII IN DEVONSHIRE.—It may be of interest to record that a specimen of *Daphnis nerii* was caught at Ilfracombe on September 22nd. It was sitting on a fig-leaf in a garden there. When brought to me it was a little rubbed on thorax, and had one of

the antennæ damaged, but otherwise was a fine specimen.—E. S. HEBBERT; Berryarber S.O., Devon, September 25th, 1909.

NOTE ON *EUPITHECIA ASSIMILATA*.—A vigorous hop, said to be of the kind known as the "Kentish Golding," was planted in the garden here about five years ago. The main object in growing it was to obtain a sun screen for the wooden construction in which are housed various boxes, cages, &c., used in rearing Lepidoptera. For this purpose it has proved very suitable, but since 1905 moths have found it a convenient shelter during the summer, and the larvæ of several species feed on the foliage; among the latter is *Eupithecia assimilata*, with which species the present note is more especially concerned. *E. assimilata* was first observed in the garden on July 1st, 1907, when a female specimen was noticed on the paling near which the hop grows. In 1908 a worn female was seen on the same fence in early June, and in July a few larvæ were found on the under sides of the hop-leaves. These produced moths the last week in July and early August. Over a score of larvæ were collected from the hop in the autumn, but the pupæ died during the winter. No example of the first flight of moths was seen this year, but on August 3rd a fine male was taken off the fence, and a worn one was noted on the 12th of the same month. Between July 20th and September 4th the foliage of the hop had been examined from time to time, and on each occasion larvæ were found. These were of all sizes, some being only in their first or second instar, whilst others were nearly full-grown. These various stages of growth were not only observed on the earliest date mentioned, but also on the later one. Between forty and fifty larvæ altogether were secured, and all the healthy ones have pupated; a rather large proportion were parasitised. One moth emerged on August 22nd, on which date several larvæ ranging in size from newly hatched to half growth were seen on the hop.

Presumably the two moths referred to as found on the paling and also the one that emerged in confinement were of the second generation—that is, descendants of parents that had wintered in the pupal state. It seems then that the first and second generations of larvæ have this year overlapped, and that larvæ of the second generation have been in point of time somewhat earlier than usual. Perhaps delay in the emergence of moths from some of the wintered pupæ, due possibly to unfavourable weather conditions, may have contributed to the overlapping. On the other hand, it is probable that some moths of the second generation may have been on the wing earlier than August 3rd, even about mid-July, and these have been the parents of the very juvenile larvæ found with the almost mature ones on July 20th.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W., September 22nd, 1909.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—July 22nd, 1909.—Mr. Alfred Sieh, F.E.S., President, in the chair.—Mr. Edwards exhibited the closely allied species *Papilio niveus* and *P. erinus* from Africa, and pointed out the distinguishing

characters.—Mr. Turner, two specimens of *Cupido minima* from Winchester, measuring only 15 mm. in expanse. They were taken on June 12th with normally sized specimens.—Mr. Kaye, living larvæ of *Callophrys rubi*, pupæ of *Celastrina argiolus*, and a growing plant of *Erica ciliaris*, which had come up accidentally in peat in a cool orchid house.—Mr. Step, a coleopteron which had been attacked by a species of Ichneumon.—Mr. Adkin, a series of *Endromis versicolor*, being part of a brood from Aviemore ova; the rest were lying over in pupa. He also showed full-fed larvæ of *Nyssia zonaria* from Wallasey ova, and gave notes on their life-history.—Mr. Adkin gave a detailed account of the persistent attempts of a sparrow to get at a *Pieris brassicæ* fluttering along inside the glass roof of his conservatory. Several instances of birds attacking lepidoptera were given by other members.—Mr. Step read the Report of the Field Meeting held at Mickleham on June 19th.—Mr. Percy Richards communicated the Report of the Field Meeting held at Coombe Wood on July 10th.

August 12th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Dennis, a specimen of the fuller's teasel, *Dipsacus fullonum*, from Halstead, Essex.—Mr. Baumann, a reed containing living pupæ of *Nonagria geminipuncta* from Lewes, and an ichneumon bred from a pupa.—Mr. Main, specimens of *Lasiocampa quercus* var. *callunæ* from Westmorland.—Mr. Step, a *Papilio machaon* mounted between glass for artistic purposes, which, although sealed up some eighteen months ago, had now produced a living imago of *Tinea biselliella*.

August 26th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. South exhibited, on behalf of Mr. Esson, a noctuid moth taken in Aberdeen, probably not only new to science but representative of a new genus. He also exhibited a slightly aberrant specimen of *Aglais urticae* bred with a number of normal examples from larvæ fed solely on hop after first instar.—Dr. Chapman, a most aberrant form of *Parasemia plantaginis* taken at Ferpecle, Val d'Herens, Switzerland, in which the black markings were reduced to little more than a few faint brownish clouds, on pale orange fore wings and darker orange hind wings.—Mr. West, Greenwich, specimens of the local Homopteron *Paramesus nervosus*, from Gravesend, among rushes.—Mr. Newman, nearly full-fed larvæ of *Eupithecia extensaria*, reared *ab ovo* on garden *Artemisia*. He also showed a larva of *Stauropus fagi*, and pointed out its resemblance to a dead and distorted leaf of beech.—Mr. F. Noad Clark, a cluster of one of the bird's-nest fungi *Nidularia* found in a garden apparently attacking old wooden bordering.

September 9th.—The President in the chair.—Mr. Lucas exhibited the freshwater sponge *Spongilla fluviatilis*, interesting as the food of the genus *Sisyra* of Neuroptera. It was from the New Forest. He also showed the rare parasitic fungus *Cordiceps ophioglossoides* from Esher.—Mr. Tonge, living specimens of *Dytiscus marginalis* and *Locusta viridissima* from Deal, and an example of *Agriopsis aprilina* which he had just bred.—Mr. Main, living specimens of the Javan cockroach, *Nauphæta circumvagans*.—Mr. Sperring, a short series of aberrant forms of *Arctia caja*, bred from larvæ whose food was varied from day to day.—Mr. Turner, a white aberration var. *alba* of *Rumicia phleas*, from Brasted. He also showed a series of *Anthrocera carni-*

olica from Gex, S. Jura, together with *A. filipendulæ* and *A. achilleæ*.—Mr. Barrett, a number of species taken fifty years ago within 20 miles of London, and still obtainable on the same ground, including *Lithosia deplana*, *Hepialus velleda*, *Aventia flexula*, *Boarmia abietaria*, and *Psammotis (Botys) hyalinalis*. On the same ground he had this year taken *Argynnis adippe*, *A. aglaia*, and *Rivula sericealis* for the first time.—Mr. Goff, a green male, a mauve male, and a dwarf female (22 mm.) of *Agriades (Lycæna) bellargus* from Steyning, N. Devonshire. He also showed a dwarf *Euchloë cardamines* 28.5 mm. in expanse.—Mr. Pratt, a specimen of *A. (L.) corydon* taken on Wimbledon Common this year.—Mr. H. Moore, twigs of elm on which were the fig-like galls caused by the Aphis, *Schizoneura lanuginosa*, obtained at Larkfield, Kent.—Mr. Sich read the Report of the Field Meeting held at Reigate on June 24th.—HY. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

Catalogue of the Lepidoptera Phalaenæ in the British Museum. Vol. viii. By SIR GEORGE F. HAMPSON, Bart. Pp. i-xiv, 1-583. With Atlas of fourteen plates in colour. London: Printed by Order of the Trustees. 1909.

As mentioned in our notice of vol. vii. of this important work, the author stated that the noctuid subfamily Acronyctinæ would occupy three volumes. In the volume now before us a further contingent of 723 species and 104 genera is comprised, thus bringing up the total number of species so far described in the subfamily to 1563. It is expected that vol. ix., the last of the three dealing with the Acronyctinæ will be published during the present year.

There are 43 genera with only a single species assigned to each. Of the 15 new genera the largest is *Omphaletis*, Hamp. (t. *florescens*, Walk.), comprising 11 species from Australia and *ethiopica*, n. sp., from British East Africa.

Over 120 species, chiefly North American, are here referred to *Acronycta*, Treit., and these are arranged in three sections as follows:—

Sect. i. *Hyboma*, Hübn. (t. *strigosa*, Schiff.) = *Viminia*, Chap. (type *rumicis*, L.).

Sect. ii. *Triæna*, Hübn. (t. *psi*, L.) = *Cuspidia*, Chap. (t. *psi*, L.).

Sect. iii. *Acronycta*, Treit. = *Acronicta*, Ochs. (t. *leporina*, L.).

The European species in Sect. ii. are *tridens*, Schiff.; *cuspidis*, Hübn.; *aceris*, L. (type of *Arctomyscis*, Hübn., and of *Apatela*, Hübn., Tent.); *alni*, L. (type of *Jocheæra*, Hübn.); *auricoma*, Schiff. (type of *Pharetra*, Hübn.); *menyanthidis*, View.; *megacephala*, Schiff.; and *euphorbia*, Schiff. The North American species *cretata*, Smith, with *leporina*, L., constitute Sect. iii.

Another large genus is *Athetis*, Hübn. (t. *furvula*, Hübn., = *lenta*, Treit.). Among the 107 species embraced therein are *ambigua*, Schiff., *alsines*, Brahm., *blanda*, Schiff., *clavipalpis*, Scop., = *quadripunctata*, Fabr., and *morpheus*, Hufn.

Eridania, Cram., is fixed as the type of *Xylomyges*, Guen., a genus with only four species, all of which are South American.

The type of *Petilampa*, Auriv., is *minima*, Haw., = *arcuosa*, Haw., and *Acosmetia morrisii*, Morris, Naturl. ii. p. 88 (1837); Humphrey and Westwood, Brit. Moths, i. p. 245, pl. 54, fig. 12, is quoted in the synonymy.

The 89 species under *Monodes*, Guen. (t. *nucicolor*, Guen.), are divided up, on antennal characters, into four sections, but as regards the first two and the last, only one species is assigned to each. All the others are included in Sect. iii., and are largely South American species; *venustula*, Hübn., alone is European.

"*Agriopsis*" *viridis*, Leech, is the type of *Daseochæta*, Warren (1907), and "*Diphthera*" *pallida*, Moore, the type of *Diphtherocome*, Warren (1907). The latter is merged in the former, and the two species mentioned with twelve others, including *alpium*, Osbeck, = *orion*, Esp., referred by authors to *Diphthera*, Hübn., are here included in one or other of the five sections of *Daseochæta*.

Gemella, Leech, originally described under *Perigea*, Guen., is the type of *Dysmilichia*, Speiser (1902); *Phalacra*, Staud. (1892), and *Milichia*, Sneller (1898), are both preoccupied names.

The 448 excellent figures in the Atlas, drawn by Horace Knight, are capitally reproduced in chromo by West, Newman & Co.

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1. *Appendages of the Second Abdominal Segment of Male Dragonflies (Order Odonata)*. By OLIVER S. THOMPSON (New York State Museum, Bulletin 124, pp. 249-263). Albany. 1908.

THIS is a most useful paper on the unique structural arrangements for copulation in the Odonata. Forms of the appendages in the different divisions of the order are fully illustrated, but in some cases fuller references to the figures seem to be called for.

2. *Les Rhaphidides (Ins. Nèvr.) du Musée de Paris*. By LONGINOS NAVAS (Annales de la Société Scient. de Bruxelles, 28 Jan. 1909).
3. *Neurópteros y Ortópteros nuevos de Aragón*. By LONGINOS NAVAS (Boletín de la Soc. Arag. de Cien. Nat. May, 1909).

Perla kheili, amongst the Neuroptera, and *Omocestus rufipes* var. *rufitarsis*, *Stauroderus intricatus*, and *Pamphagus nugatorius* amongst the Orthoptera, are here described.

4. *Monografía de la Familia de los Diláridos (Ins. Neur.)*. By LONGINOS NAVAS (Mem. de la Real Acad. de Cien. y Artes de Barcelona, June, 1909).

An important paper of fifty-five pages, with two plates, devoted to this strange and not too well known group of the Neuroptera (restricted sense). They are a small group of insects near the Hemerobii, chiefly found in the Old World. The male possesses pectinated antennæ, and the female has a long ovipositor.

W. J. L.

OBITUARY.—We have to announce, with very much regret, that Mr. H. W. BARKER, F.E.S., died on September 21st.

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SOME AUGUST BUTTERFLIES OF CANTAL AND LOZÈRE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

SEEN on the map, the country to the south of Mont Doré, and especially that within the region of the mountains of Cantal, suggests tempting ground for entomologists who wish to add to their knowledge of the fauna of Central France—*terra incognita*, it seems, alike to French and British collectors. In bygone days one or two members of the Entomological Society of France appear to have given some attention to the butterflies of Cantal; and supplementary to Maurice Sand's excellent Catalogue I find a list of captures made at le Lioran by M. Achille Guenée. With this slight material before me I had intended to visit the higher parts of the range in the early months of the summer, but again a variety of causes conspired to keep me in England until August was well in sight. The delay was doubly vexatious. It deprived me of the companionship of Mr. R. S. Standen, one of the pioneers of Continental butterfly hunting, and also brought me to the appointed spot at a date when, as I was presently to discover, the better part of the local butterflies was over and done with. To stay more than a week in such a promising-looking locality as le Lioran and actually meet with no more than two members of the *Lycænid* family is an experience without parallel in the several expeditions I have been fortunate enough to make abroad in previous years. But it is a fact that, apart from a single battered *Lycena arion*, I netted no other "blue" there except *Polyommatus alexis*, and this very rarely.

I travelled from Paris on the night of the 29th of July, and as I noticed on the return journey made by day, I had already passed through some fine scenery, when I awoke at Viescamp-sous-Jallès, the little junction where the main line to Figeac and Toulouse is crossed by the central road connecting Clermont-Ferrand and Bordeaux. Already the character of the country

was indicated: the heavily cultivated meadows and pastures strewn with occasional volcanic boulders; and, as the train laboured slowly up the steep gradient from Aurillac, accidental rocks and green-shouldered hills dignified by the name of mountains—the craters and cones of long-dead volcanoes. The country round Vic-sur-Cère, the only intermediate place of any importance, offers some good collecting-ground, as I found when I paid a day's visit there on August 4th; but the bad first fortnight of July which had brought such execrable weather even thus far south did not apparently affect the emergence of the local species, and, although *Polygonia c-album* and *Pamphila sylvanus* were still fresh, *Satyrus circe* was already *passé*, as well as most commoner things—*Pararge mæra*, &c. On the grassy slopes above the pretty village typical *Melanargia galatea* swarmed, and near a little spring, feeding quite a respectable cascade, I observed *L. alcon*, though never would the fast-flying males come within reach of the net. I mention these butterflies here because I did not meet with any of them except *M. galatea* higher up.

Le Lioran (3780 ft.)—with its several “Plombs,” and on the eastern declivity of the massive central group connecting Auvergne with Lozère—by situation and the altitude of its mountains running up to something over 6000 ft., had conjured up visions of collecting by no means to be realized. I do not think I was ever in any place presenting such attractive features, and so well adapted, climatically speaking, productive of poorer results in Lepidoptera; and Mr. Paulson, who was in the hotel collecting botanical specimens, informed me that the same state of things ruled among the flowers and plants, which disposed of the idea that the phenomenal first fortnight of July alone accounted for the dearth. Brooms of all kinds I regard with suspicion, where they flourish to the exclusion of other shrubs, for it is really surprising how very few butterflies appear to be attracted on the sunniest days and in the warmest localities even by the luscious scented golden blossoms of the larger species. Here the dwarf *Genista sagittifera* was ubiquitous in the pastures and upon the hill-footways of Upper Cantal, and appeared as distasteful to insects as to cattle. Otherwise the pleasant note of colour struck by the flowers of alpine meadows elsewhere was wanting; only the close-cropped green turf getting browner and more barren as it approached the summit of the mountains.

My first day—in every respect an ideal day for collecting—I devoted to climbing the Plomb du Cantal, the highest peak, or rather cone, of the chain. The lower forests yielded practically nothing, except at one spot where a little spring had induced some growth of rank herbage. Here *Melitea parthenie* in twos and threes was flitting about, and occasional *Chrysophanus virgaureæ*, the males of which, now and thereafter, proved to be the commonest

species on the wing. A little further up, *Erebia stygne*—the first *Erebia* of the year for me—put in an appearance, and was almost common at about 5000 ft. The form differs materially from that of Digne and the Midi—it is much smaller, and, I think, *blacker*—more resembling examples from the Vosges in my collection, taken last year by Mr. Barraud and Mr. Gibbs (*antea*, p. 115, &c.); the ocellations, moreover, are decidedly in-



(1) The two larger figures represent an aberrant form from Mende, Lozère, August, 1909 (the upper), and a normal form of *Polyommatus escheri* from St. Martin-Vésubie, Alpes-Maritimes. (2) The two lower figures represent (to the left) a normal form of *P. eros* from Pontresina, and a strongly marked under side aberration taken at Lac d'Allos, Basses-Alpes, August, 1908.

ferior, often reduced to the merest pin-points. Flying with it was *Erebia epiphron* var. *cassiope*, mostly of the form *nelamus*, Bsdv.; but several females taken show a remarkable fine band on the fore wings, with large spots, which might be regarded as var. *valesiana*, M-D., after Mr. Wheeler's description. But with these two butterflies, a single *Hesperia serratulæ* and a form of *H. carthami* with very pale under side coloration, the catalogue for the day came to an end, save for an extremely battered *Hipparchia semele* circuiting the topmost Plomb, where the tremendous wind which had sprung up effectually disconcerted both butterfly and

collector. Disappointed on this the southern side of le Lioran, I next experimented on the north, under and upon the well-wooded slopes which lead to the grassy plateau beneath the cone of the Puy Mary (5860 ft.). Three days in all I spent upon this ground, but again results were discouraging. However, there were rather more butterflies on the wing here when the furious wind permitted them to fly, and on the first occasion I discovered *Parnassius apollo* by no means uncommon, though unfortunately I captured but a single example worth bringing home, and this save in so far that it is more heavily scaled than my typical Swiss specimens presents no special characters. Indeed, nothing in Cantal I met with could be described as approaching a distinctive form, all the common August butterflies responding accurately to their typical representatives in the British Islands.

The downward road to Murat suggesting possibilities, I took special pains to work upon the verdant banks now thick with full-flavoured wild strawberries. *Erebia ligea* was not rare, and among the few things taken here I find a single example of *E. euryale*, while lower still I spent a fruitless hour endeavouring to stalk the apparently magnificent Apollos haunting the sides of a deep and almost inaccessible ravine. Later, a day spent at Murat produced nothing worth record, though it is mentioned by Sand as a locality for *E. neoridas*. Higher up *C. virgaureæ* was also generally common, and above the hotel one morning I took a single perfect example of *C. alciphron* var. *gordius*, save in smaller size presenting no superficial difference to the common form of the Midi. *Rumicia phlæas* also was rare and ordinary in appearance. In the roadside pastures, however, *M. galatea* was very abundant, with the common Hesperids, *Pamphila comma* and *Thymelicus lineola*. My Cantal catalogue, therefore, remains wholly incomplete, but, as indicating more fully the species to be met with at le Lioran, I include in the following short list some observations (marked *) made by M. Achille Guenée and M. Sand, at a time when I expect the country was more open and wild, and the excellent cheese of the Department, therefore, a less conspicuous feature at *tables d'hôte* all over the central and southern regions:—

HEPERIIDÆ.—*Carcharodus lavateræ*, Murat,* *Hesperia carthami*, *H. alveus*, *H. serratulæ*, *H. cacaliæ* * (??); *Pamphila sylvanus*, *P. comma*; *Thymelicus lineola*, *T. actæon*.

PAPILIONIDÆ.—*Papilio podalirius* and *P. machaon* (? le Lioran)*; *Parnassius apollo* (Murat, Sand); *Aporia cratægi**; *P. napi* var. *bryoniæ**; *Colias edusa*; *Gonopteryx cleopatra*, valley of the Alagnon, Murat.*

LYCENIDÆ.—*Chrysophanus virgaureæ*, *C. hippothœe*, Murat,* *C. alciphron* var. *gordius*, *C. phlæas*; *Lycæna arcas*, Murat,* *L. euphemus*,* *L. alcon* (Vic), *L. arion*; *Cupido sebrus*, Murat*;

*Nomiades semiargus**; *Polyommatus damon*, Murat,* *P. hylas*, Murat,* *P. escheri*, Murat,* *P. alexis*.

NYMPHALIDÆ. — *Melitæa parthenie*, *M. athalia**; *Argynnis aglaia**, *A. niobe**, *A. adippe*; *Issoria lathonia*; *Brenthis euphrosyne*; *Polygonia c-album* (Vic), *Pyrameis cardui*, *P. atalanta*; *Vanessa io*; *Aglais urticæ*.

SATYRIDÆ.—*Satyrus circe* (Vic); *Hipparchia semele* (one); *Erebia epiphron* var. *cassiope*, *E. ceto*, Murat* (rather doubtful, I should think, more likely to be *E. medusa*), *E. stygne*, *E. euryale*, *E. ligea*, *E. æthiops**, *E. neoridas*, Murat.*

With regard to some of the records, that of *H. cavaliæ*, reported from Murat, must be accepted with reservation. This "skipper" is essentially alpine. Murat is but 3000 ft. above sea-level, and the nearest mountain of any altitude is the Puy Griou (5560 ft.). The two or three *Pieris napi* observed by me on the Plomb du Cantal were typical, but no doubt the form *bryoniæ* might occasionally be developed here.

(To be concluded.)

LUPERINA NICKERLII, FREYER, AB. OR NEW SPECIES?

By RICHARD SOUTH.

TWENTY years ago Mr. T. Baxter sent to me, for identification, a specimen of a *Luperina* that he had captured at St. Annes-on-Sea, Lancashire.

After comparing the insect with some examples of *L. nickerlII* then in the collection of the late Mr. J. H. Leech, now in the National Collection, I concluded that the Lancashire specimen was a form connecting *nickerlII* with *gueneei*, Doubleday, and that all were therefore forms of *L. testacea* (Entom. vol. xxii. p. 271).

In 1891 Mr. Baxter obtained another specimen similar to the first but having an ochreous tinted pale greyish coloration, and this, I believe, was the type of *L. testacea* var. *incerta*, Tutt (Brit. Noct. vol. i. p. 140).

During September last Mr. Baxter and a friend—Mr. W. Gates—secured at least a dozen specimens. Two males were submitted to Mr. F. N. Pierce, the well-known author of 'The Genitalia of the Noctuidæ,' and he reports that the insects are certainly not referable to *L. testacea*. He is now most anxious to obtain one or two male specimens of *nickerlII* and also of *gueneei*. It is to be hoped that the necessary material will be available so that the question of variety or species may be definitely settled.

Gueneei is generally recognized as a form of *L. testacea*, but it might equally well be set down as a form of *L. nickerlii*. The Lancashire specimens, in fact, certainly seem to connect *gueneei* with *nickerlii*, and until it can be shown that these two can be separated one from the other, and from the Lancashire *Luperina* on structural differences in genitalia, I am inclined to accept all three as forms of one species.

If it should subsequently be established that Mr. Baxter's *Luperina* is specifically distinct from both *nickerlii* and *gueneei*, then it will have to be known as *L. incerta*, Tutt, and I propose to name the paler greyish specimens taken this year ab. *baxteri*.

Some figures of the moths are being prepared, and these, together with drawings of Mr. Pierce's preparations of the genitalia, will be published in the 'Entomologist' for December.

THE ORDERS OF INSECTA.

BY D. SHARP, M.A., M.B., F.R.S., &c.

THE question of the number of Orders that should be adopted in the Class Insecta has been much discussed, and a considerable variety of views expressed about it. The subject has just been treated by Handlirsch in his great work on Fossil Insects, and it will no doubt be of interest to enumerate the Orders he adopts for existing insects. They amount to no fewer than thirty-five, *viz.* :—

- | | | |
|--------------------|-------------------|-------------------|
| 1. Arthropleona. | 13. Mantoidea. | 25. Plectoptera. |
| 2. Symphypleona. | 14. Blattoidea. | 26. Megaloptera. |
| 3. Dicellura. | 15. Isoptera. | 27. Raphidioidea. |
| 4. Rhabdura. | 16. Corrodentia. | 28. Neuroptera. |
| 5. Machiloidea. | 17. Mallophaga. | 29. Panorpatæ. |
| 6. Lepismoidea. | 18. Siphunculata. | 30. Phryganoidea. |
| 7. Gastrotheoidea. | 19. Hymenoptera. | 31. Lepidoptera. |
| 8. Orthoptera. | 20. Coleoptera. | 32. Diptera. |
| 9. Phasmoidea. | 21. Strepsiptera. | 33. Suctoria. |
| 10. Dermaptera. | 22. Embioidea. | 34. Hemiptera. |
| 11. Diploglossata. | 23. Perlaria. | 35. Homoptera. |
| 12. Thysanoptera. | 24. Odonata. | |

A few words of explanation and comment may be acceptable about this very formidable list. Nos. 1 and 2 are the two great divisions of the old Order Collembola; 3 and 4 are the Campodeid forms, *Japyx*, *Campodea*, &c.; 5, 6, and 7 are divisions of Thysanura (7 being altogether doubtful), the old name Thysanura being still used by Handlirsch as that of a "Class" composed of these three Orders; 8, Handlirsch limits the Orthoptera to the old Saltatoria, treating each of the other great divisions (*viz.* 9, 10, 11, 13, and 14 of our list) as a separate Order, and interpolating

12, Thysanoptera, among them; 15, Isoptera or Termites; 16, Corrodentia limited to Psocidæ; 17 to 25 call for no remark; 26 consists of the forms allied to *Sialis* and *Chauliodes*; 27 includes only Raphidiidæ; 28 consists of Hemerobiid forms; of 29–35 it is only necessary to remark that the name Suctoria is applied to the fleas.

For Handlirsch's purposes it was desirable to adopt more Orders than are perhaps really necessary from the morphological and developmental points of view, and I think the following list may be considered sufficiently ample at the present day, *viz.*:—

THE ORDERS ARRANGED.

APTERYGOTA.

- | | | |
|---|---|--|
| 1. Collembola
(or Apontoptera or Synaptera). | } | Wingless insects supposed to have descended from wingless ancestors. |
| 2. Campodeioidæ. | | |
| 3. Thysanura
(or Apteræ). | | |

ANAPTERYGOTA.

- | | | |
|--------------------------------------|---|--|
| 4. Mallophaga
(or Lipoptera). | } | Wingless insects whose ancestors were probably winged. |
| 5. Anoplura
(or Ellipoptera). | | |
| 6. Siphonaptera
(or Aphaniptera). | | |

EXOPTYERYGOTA.

- | | | |
|--|---|--|
| 7. Orthoptera. | } | Winged insects whose wings develop outside the body. |
| 8. Plecoptera.
(= Perlaria.) | | |
| 9. Psocoptera.
(= Corrodentia.) | | |
| 10. Isoptera.
(= Termites.) | | |
| 11. Embioptera
(or Embioidea). | | |
| 12. Ephemeroptera.
(= Plectoptera.) | | |
| 13. Odonata
(or Paraneuroptera). | | |
| 14. Thysanoptera. | | |
| 15. Hemiptera. | | |

ENDOPTYERYGOTA.

- | | | |
|-------------------------------------|---|--|
| 16. Neuroptera.
(= Planipennia.) | } | Winged insects whose wings arise as invaginations of the hypodermis, and for a time project within the body. |
| 17. Trichoptera. | | |
| 18. Lepidoptera. | | |
| 19. Coleoptera. | | |
| 20. Strepsiptera. | | |
| 21. Diptera. | | |
| 22. Hymenoptera. | | |

In view of the great advantage of having a uniform system of terminations, I have added in this list certain alternative names in brackets. They are mostly those proposed by Prof. Shipley in Zool. Anz. xxvii. 1904, and made use of in Prof. Sedgwick's recent 'Text-book of Zoology,' vol. iii. 1909.

A NEW SPECIES OF *MORPHOTENARIS* FROM DUTCH NEW GUINEA.

BY PERCY I. LATHY, F.Z.S., F.E.S.

Morphotenaris adamsi, sp. nov.

♂. Upper side. Fore wing pearly white; a wide curved fascia from base to inner angle, the part within cell being blackish brown and beyond cell orange-brown. Hind wings pearly white, with tuft of brown hairs near base and below cell. Under side. Fore wing as above, but fascia darker in colour, and above fascia three submarginal white-centred black spots. Hind wing white, tinted with ochreous, particularly along costa and inner margin, a series of five submarginal ocelli, of which the upper is the largest and the next two smaller than the two lower ones; these ocelli are ochreous, faintly ringed with black, and contain a white-centred black spot.

♀. Similar to ♂ but larger, the orange-brown of fascia more suffused with black, and no tuft of hair on hind wings. Exp. ♂ 110 mm. ♀ 128 mm.

Hab. Ninay Valley, Dutch New Guinea.

This fine new species was captured by Mr. A. E. Pratt, during the months of November and December, 1908, and January, 1909, at an elevation of 3500 ft. Mr. Adams' series consists of one male and eight females.

The nearest ally is *M. schonbergi*, Fruhst., from which it may easily be distinguished by parti-coloured fascia, the black spots on fore wings below, and smaller ocelli of hind wings below.

SIX WEEKS AMONGST HUNGARIAN BUTTERFLIES.

BY W. G. SHELDON, F.E.S.

(Continued from p. 251.)

ON June 14th we entrained for Herculesbad. I had been told by Budapest entomologists that the season in Hungary was a bad one, but not until Herculesbad was reached did I realise how bad it was, for there, in my judgment, not more than twenty-five per cent. of the specimens I ought to have met with were seen—a calculation made by comparing the results of those British lepidopterists who had preceded me with my own.

I should strongly recommend anyone working Herculesbad to secure at the outset a very good map of the district, which can be purchased at the Bazaar for two kronen = 1s. 8d., and which shows the position of the various localities well known to lepidopterists, but otherwise difficult to determine.

We spent several days collecting by the road (above Herculesbad) which traverses the Cserna valley. Here *Neptis aceris* was common, but worn; which was only natural, for Dr. Fischer, whom we met and who kindly gave us the benefit of his experience at Herculesbad, informed me that the first brood is often out by the end of April, and I understood that to get it in perfect condition one ought to be in its locality not later than the middle of May. Here, also, were *Brenthis daphne* in plenty—with *Melitæa athalia* and var. *mehadensis* the most abundant butterflies. *Lycæna arion*, a small obscure form, occurred in a dingle where a stream crossed under the road just beyond a hot sulphur spring, where also *Everes argiades* var. *coretas* was not infrequent, and a solitary example of *Brenthis hecate* was netted, the only one seen in the district. A clearing on the left side of the road, just before we reached the dingle, was gay with flowers and large numbers of Lepidoptera, including several examples of *Carcharodus altheæ*, a species that has always been rare with me, and one or two *C. alceæ*; a fine form of *Chrysophanus virgaureæ* occurred, and plenty of *Thecla acaciæ*, *T. ilicis*, and *T. w-album*; near this spot, too, *Chrysophanus alciphron* was common. On comparing my specimens of this species from the three localities in which they were taken, I found a rather striking difference between them. Those from Pészer are the most extreme of the three, with the strongest purple tinge and the least indication of copper in both sexes; those from Herculesbad had the purple less strongly developed, with a much larger amount of copper; and one example that I saw some 2000 ft. above Herculesbad, but did not capture, struck me as very little darker than some Swiss *C.* var. *gordius* that I have seen; the Szada specimens are intermediate between those from the other two localities.

A couple of *Limenitis populi* var. *tremulæ* were taken at rest on the road near the town; and two or three *Apatura ilia* var. *clytie* were observed in the same place. Mr. Tylecote the day before he left for England (June 22nd) captured on the road, about a mile above Herculesbad, a fine *Eugonia xanthomelas*, the only example either of us came across, though Dr. Fischer informed me that a Hungarian lepidopterist, a few days before our advent at Herculesbad, had taken several.

A fine brood of *Polyommatus orion* var. *ornata* was abundant, generally extending as high as the Quelle. Amongst the species not usually recorded from Herculesbad was a specimen of *Chrysophanus thersamon*, taken on June 29th in good condition

in one of the meadows on the Coronini hill; probably one of a second brood.

Pieris napi var. *napeæ* was abundant everywhere, especially in the ravine leading up to the Quelle; the examples were large, many of them having an expanse of 55 mm., whilst one expands 57 mm., and the females were heavily spotted. From ova deposited by captured females I reared a few examples after my return home; these were var. *napeæ* of course, and closely resembled their parents. At the higher levels on the first few days of my visit I came across a few typical specimens; evidently these belonged to an earlier brood; they were not in good condition.

Pieris rapæ was equally abundant with its relative, but did not, within my observation, extend much above the valley. The form was a very handsome one, with pronounced black tips to the front wings, brilliant canary under sides to hind wings, and heavily spotted females.

I spent the morning of June 17th on the Coronini hill, but did not add much to my knowledge or collecting-boxes, for the day was unfavourable and the grass in the meadow had been cut. Doubtless earlier in the summer the hill is more prolific.

I was told at Budapest that *Thais polyxena* did not occur at Herculesbad, and was therefore surprised to find that the larvæ were quite abundant on the banks of the Cserna just below the town. A species I much wanted was the elusive *Libythea celtis*, which almost eluded me, for although several specimens were seen near the town on June 21st, and one was netted, they disappeared from there mysteriously the next day, and except for one taken at the Domogled Quelle on June 22nd I did not see another example. Evidently there was an emergence about June 20th, the specimens of which seem to have migrated to another locality a day or two afterwards.

After June 21st all the better insects deserted the roads, and I had no option but to work the higher ground. The best collecting at Herculesbad seems to be centred upon the slopes of the Domogled, a mountain which lies south-east of the town, and rises to some 3000 ft. above it. Mr. Jones in 1907 having made a very successful ascent of this mountain under the auspices of a local guide, Nicholas Kolopenza, I thought I could not do better for a start than to send for him, and stipulate that I should go up the mountain by the road Mr. Jones had patronized. I am afraid, however, something went wrong, for I was taken down the road leading to the station for a mile or so until we got to a place where some mining operations were going on; here we assaulted the mountain from the south-west, a very steep, dry, hot route, on which I did not see a single butterfly I wanted, and by the time the summit was reached I had had enough of it. After my experience I should advise anyone work-

ing the Domogled to steadfastly refuse to go up by any other way than that past the Weisses Kreuze; the path by this route is good, the slopes are easy, one is in shade practically all the way, and, best of all, the butterflies that affect the mountain are there found most abundantly.

My chief object in working the Domogled was to obtain a good series of *Neptis lucilla*, which is usually abundant there, though rare in the Cserna valley; judging by Mr. Jones's experience I ought to have obtained my object in one journey; I did certainly eventually obtain about two dozen fine examples, but I made eight ascents for them, during which I calculate I climbed not less than 18,000 ft. I suppose the books are right in giving the food-plant of this species as *Spiræa salicifolia*, and that of *N. aceris* as *Orobus vernus*, but I could not see anywhere at Herculesbad a plant that I should consider a *Spiræa*, nor did I ever see a specimen of *Neptis aceris* near a plant of *Orobus vernus*, which was abundant in certain places there. The habits and haunts of both these butterflies are similar, except that *Neptis aceris* rarely rises much above the Cserna valley, whilst *N. lucilla* is scarce until one gets up at least 1000 ft. Both seem to delight in small clearings in the forest, and if one of these is found overgrown with *Clematis vitalba* or bramble, one or two specimens of a *Neptis* is pretty sure to be there sailing slowly round the bushes on motionless wings, except for an occasional flap to give impetus, and from time to time settling upon some spray or approaching the resting place of another specimen, which will thereupon rise and toy or fight with the intruder, both soaring to a considerable height, then separating, and each proceeding on its way, which did not usually take it out of the clearing. Both species not infrequently settle on the ground in dry weather, probably for the sake of moisture they find there. The flight being so slow would lead one to suppose they are easy to capture; this is not so, however; the very slowness of the motion leading one to strike in advance, and at *Neptis lucilla* especially I missed quite a number of apparently ludicrously easy shots.

Beyond *N. lucilla* I did not see much of note on the Domogled; most of the species previously noted in the Cserna valley were there in some numbers, and on the peak itself *Erebia medusa* var. *psodea* was not infrequent, the males in bad order, the females fairly fresh; this species was not confined to the peak, one example being netted by Mr. Tylecote a few hundred feet above Herculesbad, whilst I found two or three in an alpine meadow on the way up the mountain at an altitude of about 2000 ft. On the peak *Melitæa trivia* was fairly common, and still in good condition on June 21st. The Quelle clearing, where in most years good insects usually swarm, was an extraordinary failure, and beyond a few *M. maturna*, one example of

Libythea celtis, and two *Neptis lucilla* I saw there absolutely nothing I cared to net.

One of the chief entomological lions of Herculesbad is of course *Pararge roxelana*, which is hardly known to occur elsewhere in Europe outside the Balkans. This fine species is found in most of the woods, possibly in all of them, up to six or seven hundred feet above the river, but the best locality is said to be the wood in which is the path leading up to the Weisses Kreuze. At Herculesbad it is essentially a wood frequenter, seldom being seen in the open. The ground is exceptionally difficult to work, for it slopes up at an angle of from 50° to 60° , and following a lively butterfly, which *P. roxelana* is, under those conditions is absurd; one's only possible plan therefore is to try to find a level spot in his haunts, and to endeavour to net him as he passes it. Such an opportunity is offered by the path leading up to the Weisses Kreuze. The orthodox manner of catching *P. roxelana*, I was told, is to watch until he settles on a tree-trunk, and then to cautiously put your net over him, holding the end of the bag in the left hand to enable him to fly into it, when of course the rest is easy to perform. This is admirable in theory, and possibly under certain conditions, such as large trees and small nets, it might act; but I tried it on half a dozen occasions, and missed as many butterflies. The large trees in the Kreuze wood are mixed with a great number of small ones, and *P. roxelana* would invariably insist upon resting upon these latter, with the result that when I had succeeded in covering the front door with the net the intended victim just quietly slipped out by the back. There are, however, certain conditions under which *P. roxelana* is as tame and stupid as a barndoor fowl, though he is usually as lively and wild as a March hare. On a certain day I was descending from the Domogled towards noon, and whilst in the higher part of the Kreuze wood was overtaken by a terrific hailstorm, during which I obtained what shelter I could from a bush and a bicycle cape. Whilst the storm was at its height to my amazement a magnificent *P. roxelana* fluttered down from somewhere, and settled on the ground within a yard of me. I made no mistake with him!

(To be continued.)

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

By CLAUDE MORLEY, F.Z.S., F.E.S.

(Continued from p. 257.)

23. *Chionaspis pinifoliæ*, Fitch.*

IN America, Howard (Revis. p. 21) says *Perissopterus pulchellus*, How., and *Aphelinus mytilaspidis*, Baron (l.c. p. 25),

attack *C. pinifolii*, ?Baron; while in Europe *Prospalta aurantii*, How., is said by Dalla Torre (Cat. v.) to have been bred from *Leucaspis pinifoliæ*.

24. *Chionaspis furfurus*, Fitch.*

Ablerus clisiocampæ, Ashm., originally bred from Bombyces, is said to prey upon this species by Howard (Revis. p. 42).

25. *Chionaspis euonymi*, Comst.*

In the same paper (p. 27) *Aphelinus fuscipennis*, How., is recorded hence.

26. *Chionaspis quercus*, Comst.* 27. *C. americana*, John.*

Both these species are attacked by *Physcus variicornis*, How. (Revis. p. 43).

28. *Chionaspis permutans*, Green.*

Aphelinus mytilaspidis, Baron, is the only parasite known from this host (Howard, Revis. p. 25).

29. *Chionaspis eugeniæ*, Mask.*

The cosmopolitan *Arrhenophagus chionaspidis*, Aur., is recorded hence by Ashmead (1900, p. 409).

30. MYTILASPIS.

From an unnamed species of this genus on *Salix* Howard records (Revis. p. 26) *Aphelinus abnormis*, and from another specimen of the same genus (*l. c.*) his *A. diaspidis* was bred.

31. *Mytilaspis pomorum*, Behé.

Several parasites have been described from this destructive species in America: *Aphelinus abnormis* (How., Revis. p. 26), *A. fuscipennis* (*l. c.* p. 27), *A. mytilaspidis* (*l. c.* p. 25), *Chiloneurus diaspidinarum*, How. ('Insect Life,' 1894, p. 256), and the Proctotrypid, *Anaphes gracilis*, How. (Report Ent. U. S. Dept. Agric. 1881, p. 370).

32. *Mytilaspis gloverii*, Pack.*

Ashmead assigns his Floridan *Signiphora flavopalliata* (1900, p. 411) to this species, and *Aphelinus fuscipennis* is also recorded from it by Howard (Revis. p. 27).

33. *Mytilaspis beekii*, Newm.*

From *Aspidiotus citricola*, Pack., Ashmead ('Orange Insects,' 1880, p. 31) gives *Signiphora flavopalliata*; Howard adds *Prospalta aurantii* (Revis. p. 41), *Aphycus flavus* (Report Ent. U. S. Dept. Agric. 1881, p. 365), from the West Indies; and his *Signiphora flavopalliata* is said to also prey upon it by Ashm. (p. 411).

34. *Mytilaspis concolor*, Ckll.*

From *M. albus* var. *concolor*—now considered a good species—his *Prospalta aurantii* is given by Howard (Revis. p. 41) from North America.

35. *Mytilaspis eucalypti*, Crawf.*

This species is attacked in Australia by the same parasite as the last.

36. *Eriopeltes lichtensteinii*, Sign.*

Gaulle (Cat. 99) gives this species, under the genus *Eriophorus*, as destroyed by *Sceptrophorus cyanifrons*, Dalm., in France.

37. *Eriopeltes festuæ*, Fonsc.

The same author brings forward (p. 106) *Aphelinus abdominalis*, Dalm. (nec Nees) as a parasite of *Coccus festuæ*, but later (p. 97) simply instances *Ectroma rufum*, Dalm. (*lindus*, Walk.) and *Bæocharis pascuorum*, Mayr., as attacking Coccids on grasses.

38. CEROPLASTES.

Unspecified members of this genus are said by Ashmead to be attacked by *Asteropæus primus*, How., in Mexico (p. 405), and *Aphycus mexicanus*, How. (p. 387 et Revis. Aphel. 1895, p. 22).

39. *Ceroplastes rusci*, Linn.*

C. artemisiæ, Riley (et ? Rossi) is destroyed by *Aphycus ceroplastis*, How., according to that author (Descr. N. Am. Chal. 1885, p. 18).

40. *Ceroplastes cerripediformis*, Comst.*

The parasite of this species is *Aphycus mexicanus*, in North America (Ashm. 1900, p. 387).

41. *Ceroplastes actiniformis*, Green.*

Howard records (Proc. U. S. Nat. Museum, 1896, p. 633) this as the host of *Coccophagus orientalis* in Ceylon.

42. *Vinsonia stellifera*, Westw.

And, in like manner (p. 639), *Anicetus ceylonensis*, How., preys upon this species.

(To be continued.)

CONTRIBUTIONS TO A KNOWLEDGE OF ETHIOPIAN ECONOMIC ENTOMOLOGY.

BY W. L. DISTANT.

COLEOPTERA.

CURCULIONIDÆ.

Apion armipes, Wagn.

I HAVE received some specimens of this species (identified for me by Mr. G. J. Arrow) from Mr. Kenneth J. Cameron, which is

a pest to cotton near Zomba, Nyasaland. Mr. Cameron, writing under date of August 2nd, 1909, says:—"Fully a month ago I found what I considered to be a small weevil crawling along a cotton plant. I found them in the stem just on the point of emerging, but not until a week ago had I time to collect sufficient specimens to send you. These weevils do most damage just where the cotton-stem enters the soil, but I find they are also in the joint of stem and branches, or what was at one time a branch bud. I am afraid this plague is more serious than I at first anticipated. It may be a difficult matter to keep a cotton plantation clear of them." Mr. Cameron also sent me a piece of cotton-stem showing holes made by the weevil when emerging from cell, and another "with insect formation or cell, like that on beans."

Alcides arcuatus, Boh., var.

This beetle (identified for me by Mr. Guy Marshall) was also received from Mr. Cameron. He informs me:—"For some years back I am aware that a beetle lays its eggs in bean-stems when the bean is only a few weeks old. The larvæ from these eggs live on or consume the bean-stem, and thus reduce the crop considerably. At times, with the cutting up of this beetle to lay its eggs, the stems become broken down; at other times the larvæ to the number of ten, sometimes even twelve, develop in the stem without much apparent notice, unless attention is directed to it. About the time the beans are fully ripe the larvæ have assumed the perfect condition, but can easily be destroyed before that time. However, the cultivation of beans in this country, so far, is of little importance."

RHYNCHOTA.

HETEROPTERA.

Fam. LYGÆIDÆ.

Oxycarenus gossipinus.

Oxycarenus gossipinus, Dist. ('Entomologist,' 1906, p. 269).

This species, already recorded as a cotton pest from West Africa, may now—from specimens since shown me by Mr. G. C. Dudgeon—be also known as injurious to *Hibiscus esculentus*,* the pods of which it infests. The specimens recently brought home by Mr. Dudgeon are rather larger than the typical ones previously described, and measure from $3\frac{1}{2}$ to 5 millim., while the margins of the pronotum are concolorous.

O. exitiosus, Dist. ('Entomologist,' 1905, p. 169) has already been recorded as injurious to the peach, and destructive to cotton-seed.

* Another Rhynchotan species (*Dysdercus cingulatus*) is a pest to Bhindi (*Hibiscus esculentus*), in India.—Cf. Maxwell Lefroy, Agricultural Research Institute, Pusa. Bull. x. (1908).

NOTES AND OBSERVATIONS.

BRITISH CARABIDÆ.—I am making an inquiry as to the variation of the wings in Carabidæ, and so far as I have gone at present the results are promising to be of interest. But I cannot hope to make it satisfactory without the assistance of other entomologists, and I shall be greatly obliged if anyone will send me fresh specimens. I prefer them unmounted, and they should not be kept long in laurel. One of the points is whether there is local variation. Specimens of species, even the commoner, from out-of-the-way localities would be very acceptable. Specially glad should I be to receive localised species, which we may presume to be isolated from other colonies of the same species.—D. SHARP; Brockenhurst, October 11th, 1909.

ACIDALIA DEGENERARIA IN DEVONSHIRE.—Last year Mr. J. Walker, of Torquay, was good enough to send me a pair of *A. degeneraria* that he had reared, with others, from eggs laid by a female moth captured in the Torquay district. Just recently he forwarded two other specimens that he had netted during the present year; these are a trifle larger but not so good in condition as the bred examples. Mr. Walker states that he first met with the species in 1897, but did not see it again until 1904. "Since 1904," he writes, "I have taken and bred them from wild females every year." He considers that *A. degeneraria* in Devon is of a different form to that occurring in Portland, and thinks that it should have a varietal name. Except that the purplish bands are dusky rather than reddish tinged, I do not find any particular difference between Torquay specimens and examples of a second generation from Portland parents, reared in September, 1904, by Mr. Hyde, of Weymouth.—RICHARD SOUTH.

ZEPHYRUS BETULÆ, ab.—I should like to record the following:—From some larvæ of *Z. betulæ* obtained last June near Peterborough I have bred a female imago which has an orange band along the entire costal margin, tapering to a point at the tip of the wing, and reaching in width to the orange blotch in the middle of the wing. The hind wings are rather thickly sprinkled with orange, and the specimen is somewhat small, about the size of the male.—J. B. MORRIS; 14, Ranelagh Avenue, Barnes, October 14th, 1909.

THE GENERIC NAME LOMOGRAPHIA.—There is a serious discrepancy in the usage of the name *Lomographa*, Hübner ('Verzeichniss,' p. 311) by our leading workers. It was originally a mixed genus, consisting of *bimaculata*, Fab. = *taminaria*, Hüb., *trimaculata*, Vill. = *permutaria*, Hüb., and *lævigata*, Scop. = *renularia et lævigaria*, Hüb., and was allowed to lie dormant until Meyrick (Trans. Ent. Soc. Lond. 1892, p. 110) resuscitated it for *trimaculata* and its congeners, removing the other two. Thus *trimaculata* ought to be the type of the genus, and I beg to "select" it as such, in accordance with the requirements of the International Code, unless this be considered to have been done already by Meyrick. Warren has been using the name erroneously in place of *Bapta*, Steph., and has a note in Nov. Zool. vi. p. 342; he ignores Meyrick's first work (published March, 1892), though referring to a later one (June, 1892), and his suggestion that *bimaculata* is "the proper type of *Lomographa*" is untenable.

He does not seem to "select a type," but merely bases his assumption on a mechanical rule of "first species = type," which has no force; Grote's citation of *temerata* as type (Allg. Zeit. Ent. vii. p. 471, 1902) is of course *ultra vires*, and Meyrick's usage has seven years' priority over Warren's and ten over Grote's. The correct synonymy is:—(1) *Bapta*, Steph. (1831) = *Corycia*, Dup. (1829, nom. præocc.) = *Lomographa*, Warr., Grote (nec Hüb., Meyr. restr.), type *bimaculata*, Fab. (2) *Lomographa*, Hüb. (1826?, Meyr. restr.) = *Stegania*, Guen. = *Terpnomicta*, Led., type *trimaculata*, Vill. — LOUIS B. PROUT; 246, Richmond Road, N.E., October 13th, 1909.

THE FOOD-PLANT OF *LYCÆNA PHERETES*.—I have been reading in the 'Entomologist' (*antea*, p. 221) of Dr. Chapman's interesting discovery that *Soldanella alpina* is the food-plant of *Lycæna orbitulus*. I feel that I should put on record that on July 15th of last year (1908), in the Roseg Thal, Ober-Engadin, I found *L. pheretes* in considerable numbers on a very limited area of ground, and always associated with *Astragalus alpinus*, L. (*Phaca astragalina*, DC.). It was a damp dull day, and late in the afternoon, and I did not see the females laying on the plant while at large; but several females, which I easily boxed, when in captivity afterwards laid very freely on sprays of the plant, while only one ovum was placed upon a piece of *Lotus corniculatus* which I offered them in addition. The larvæ fed freely on some *Astragalus* which I brought home, but I was unwisely tempted to try to rear too many for the plants, and when the latter were eaten I could find no allied plant, either in my own rock-garden nor in several of our English nurseries, that would satisfy them, and one by one the larvæ disappeared—hybernated, as I hoped. But none showed when spring came round, and I think they perished before they were ready to go into winter quarters. When I saw them last some of the larvæ were in their third stage; they closely resembled the pale green hairy pinnae of the *Astragalus foliage*. This fact, coupled with their unwillingness to take to any of the several other dwarf plants of the family which I offered them, justifies me, I think, in assuming that this is the food-plant of *L. pheretes*.—W. H. ST. QUINTIN; Scampston, York.

CUCULLIA UMBRATICA, A FERTILIZER OF ORCHIS MACULATA.—At Onich, Inverness-shire, in August, I found at rest on a post a specimen of the above moth with one of the pollen masses of the orchid named attached to the head just above the eye. The observation is of interest, since the chief authority on this subject, Hermann Müller, gives no lepidopterous visitors for the orchid in his 'Fertilization of Flowers' (1883). C. Darwin records as insect visitors Cerambycidae and humble-bees, and Empidæ (George Darwin). Müller says the flower is chiefly visited by Diptera. The only orchid in flower at the time of the observation was *O. maculata*, which was quite common in the district. A comparison of the pollen mass on the moth with some extracted from the flowers proved their identity. My earliest recollection of *C. umbratica* as a flower-frequenting species was during the summer of 1868, when I first commenced collecting. The moth was seen every evening in abundance over the honeysuckle growing in our garden at Leyton, in Essex.—R. MELDOLA; 6, Brunswick Square, W.C., October 16th, 1909.

CAPTURES AND FIELD REPORTS.

EXTRAORDINARY ABUNDANCE OF, AND DESTRUCTION BY, THE LARVÆ OF *PIERIS BRASSICÆ*.—One noticeable entomological feature of the past autumn has been the extraordinary abundance of the larvæ of *Pieris brassicæ*, which have done an immense amount of injury to cabbage and other cultivated plants of the *Brassica* genus in fields and gardens. A farmer told me of an instance where six acres of kale were completely destroyed by these caterpillars; every leaf had been devoured, the stalks alone remaining, which presented a curious and melancholy spectacle. The larvæ have committed great havoc with the cabbages in our own gardens.—JOSEPH ANDERSON; Chichester.

LARVA OF *MANDUCA ATROPOS* AT CHICHESTER.—A larva of *Manduca atropos* just on the point of pupating was brought to me on September 16th. It was dug up with potatoes. The interference was probably inopportune, and resulted in death before the last ecdysis. This is the only instance of the occurrence of *Manduca atropos* in any stage known to me this year in this locality.—JOSEPH ANDERSON; Chichester.

APATURA IRIS AND *VANESSA ANTIOPA* IN ESSEX.—A female specimen of *Apatura iris* was seen in this neighbourhood this summer by a young collector, Mr. Webster. It had settled on the ground but a short distance from him. As there is a good deal of oak and some sallow in the vicinity, it is quite possible that this was a wild individual. Mr. P. I. Lathy informs me that he saw a specimen of *Vanessa antiopa* at Broxbourne. Another individual of this species was observed within the precincts of the Royal Small Arms Factory at Enfield.—GEORGE TALBOT; 11, Palace Gardens, Enfield.

A FEW INSECTS FROM BRAEMAR.—Dr. D. Sharp was kind enough to give me a few insects which he took at Braemar in June of this year. They were:—Neuroptera: *Raphidia maculicollis*, two males and two females, together with a female pupa. Plecoptera: *Dictyopteryx mortoni*, five males and a female; *Dictyopterygella recta*, a nymph almost certainly, and three imagines; *Chloroperla grammica*, one; *Teniopteryx risi*, two; *Nemoura variegata*, a male and a female. Trichoptera: *Brachycentrus subnubilus*, two.—W. J. LUCAS.

NOTES ON THE SEASON.—I was able to spend the morning of Saturday, August 7th last, one of the few really favourable collecting days in the past season, in Folkestone Warren. *Peronea aspersana* was flying among the *Poterium*; *Pyrausta anguinialis*, *Coleophora lirella*, *Lozopera dilucidana*, *L. francillana*, and other species were about. I think I saw more insects on this particular morning than I had seen during a whole fortnight spent in Lincolnshire in the middle of July, when the only interesting Lepidoptera noticed were *Tapinostola elymi*, at Mablethorpe, and a few *Scoparia ulmella*, near Wiltoughby.—F. G. WHITTLE; 7, Marine Avenue, Southend, October 9th.

ABUNDANCE OF *VANESSA IO*.—In July, along the roads around Sidmouth, the larvæ of this insect were abundant on the nettles. I could have taken hundreds.—A. H. G. NETHERCOT.

ENNOMOS AUTUMNARIA AT RAMSGATE.—Seeing that this insect is far from common in a wild state in Britain, I thought it would be interesting to note that ten specimens have been taken at light between September 23rd and October 2nd. — N. C. E. MILLER; 66, Ellington Road, Ramsgate.

ACRONYCTA ALNI AND CIRRHÆDIA XERAMPHELINA NEAR SHREWSBURY.—I have to record the occurrence, in the middle of August last, of two larvæ of *Acronycta alni*, one found by myself in my garden at Meole Brace, the other by Mr. H. E. Forrest at Bayston Hill, about a mile distant, in both instances feeding on roses. Also at light, on the evening of September 5th, a fine but rather pale variety of *C. xerampelina*. Both species are mentioned in Mr. Newnham's Catalogue of Church Stretton Lepidoptera, but, so far as I can gather, neither have been yet noticed so near the town of Shrewsbury. I may add that both larvæ of *A. alni* pupated healthily a few days after they were found.—J. COSMO MELVILL; Meole Brace Hall, Shrewsbury, October 15th, 1909.

ABRAXAS GROSSULARIATA ab. LACTICOLOR.—A female specimen of this insect was taken on July 30th of this year by S. Carlier in Gladstone Road, Dorridge, being the third specimen recorded for Warwickshire in 1909.—E. WACE CARLIER.

PHRYXUS (DEILEPHILA) LIVORNICA AT BLACKPOOL.—A very fine specimen of *Deilephila livornica* was brought me yesterday by a friend of mine; it was taken by a man who was playing bowls at the No. 3 Hotel, Blackpool, who picked it up on the green there, and it was alive when it reached me in a tumbler tied over with paper.—T. H. SHEPHERD; 17, Slope View, Carr Lane, Shipley, Yorks, Oct. 19th.

SUGAR A FAILURE, JUNE AND JULY.—My experience has been somewhat similar to that of Mr. Jones (*antea*, p. 259), with perhaps the exception of June. In that month, up to the 21st, I found moths came freely to sugar. At the same time some of the oak and ash trees were absolutely bare of leaves. The first half of July I spent at Sidmouth, but neither on the hills nor in the woods a few miles inland would sugar attract. On my return home the same fate befell me, and it was not until August 27th that I took any moths at sugar; even then they were quite common sorts and few in numbers, although on August 10th moths were attracted to light in profusion, and a large quantity were boxed off the window fronts. Since the middle of September the weather has been so bad that collecting had to be abandoned. I do not think the reason suggested is the correct one, inasmuch as the flowers at Sidmouth and Swindon have not been so abundant as in other years, when better luck attended one's efforts. I may mention, too, that at Harpford Woods, where in 1908 *Argynnis paphia*, *Melanargia galatea*, *Epinephle ianira*, *E. tithonus*, *Aphantopus hyperanthus*, *Adopæa linea*, and *Augiades comma* swarmed, I only saw during this summer one *Pararge egeria* and a few *H. ianira*. —A. H. G. NETHERCOT; Woodland Leigh, Spring Gardens, Swindon, October 15th, 1909.

NOTES FROM INVERNESS-SHIRE, 1909.—During the month of August collecting was carried on at Onich in the above county, and

as this district appears to have been very little investigated from the entomological point of view the following notes may be of interest:—

In the way of captures the most noteworthy species were: *P. interrogationis*, *N. castanea*, *N. glaucosa*, *E. lutulenta* (a melanic form), and *S. anomala*. *N. ditrapezium*, taken at light, adds another Scottish locality for this species. In addition to the common and widely occurring Geometers, the following were taken: *D. obfuscaria*, *L. salicata*, *Eup. expallidata*, *E. castigata*, *E. nanata*, and *E. centaureata (oblongata)*. As *Vanessa atalanta* was so abundant last autumn in the southern counties, it may be recorded that this butterfly was also common in the north this year, every nettle-bed examined furnishing the larva of this species and of *V. urticae* in profusion. Special attention was paid to the bog-myrtle, which grows abundantly in all the marshy hollows in the moorland districts about Onich. The first point noted was that the larva of *Hadena pisi* prefers this plant to broom. The latter also grows luxuriantly on the drier parts of the moors, but no *H. pisi* larvæ were ever seen or beaten from it; they were quite common on *Myrica* on which they fed freely in confinement in preference to broom supplied at the same time. The larva of *A. menyanthidis* occurred also commonly, and a number fed upon *Myrica* have now pupated in the breeding-cage. The larva of *M. hastata* occurred sparingly, and generally ichneumoned. On the same plant the larva of *P. lipsiana* was abundant, but the majority were ichneumoned, and a small percentage only emerged as imagos in September and October. The food-plant of this species is generally stated to be *Vaccinium*. With respect to Tortrices the occurrence of *G. nigromaculana* may be recorded, and the list of food-plants of *P. sponsana* extended. Although birch, oak, hornbeam, and mountain ash have been mentioned, the last-named species of *Peronea* is generally stated to feed upon beech, but pupæ found between the spun-up leaves of willow and of sycamore also yielded this moth. The leaves of one particular sycamore tree were quite riddled by these larvæ, a large percentage of which proved to be ichneumoned.—R. MELDOLA; 6, Brunswick Square, October 12th, 1909.

HUNTINGDONSHIRE DRAGONFLIES, 1909.—My visits to Huntingdonshire this summer afforded very few opportunities for collecting, in consequence of the persistence of dull and rainy weather. I was fortunate enough, however, to make acquaintance with *Libellula fulva* as a living insect. This was the only Anisopterid species met with, and a few specimens were seen, including a pair *in cop.*, flying over the River Ouse at Hartford; but they were extremely active, and two or three days were consumed in their pursuit before a specimen could be secured (July 2nd). It was a fully matured male, having the abdomen wholly blue; the eyes were slaty-blue above, with a greenish tinge below. The only previous record which I can find of the occurrence of this species in the county is that given in Stephens's 'Ill. Brit. Ent.' (VI. Mand. p. 93, 1836), where *L. bimaculata* (= *L. fulva*) is stated to have been "taken in the neighbourhood of Whittlesea Mere in June." A few pairs of *Lestes dryas* were again obtained from ditches near Ramsey (June 28th), but they were in an immature state. The pterostigmata, which in the adults are blackish,

were in the earliest stages yellowish, and none of the males had developed the pruinose condition proper to the sex. The eyes of fully matured males are remarkable for their exquisite blue coloration, but the eyes of the examples taken this year were, alike in both sexes, chestnut-brown. *L. sponsa* was apparently not yet on the wing. The following Agrionids were also collected (June 23rd to July 2nd):—*Calopteryx splendens* (in fine condition and unusually common, Hartford); *Erythronma naias* (one female, Hartford); *Ischnura elegans* (abundant, Hartford and Ramsey) with its female forms *rufescens* and *infuscans*; *Agrion puella* (not common, Hartford and Ramsey); and *A. pulchellum* (common, Hartford and Ramsey). A female of *C. splendens* (July 2nd) was exceptionally large, measuring 47 mm. in length and 69 mm. in alar expanse.—F. W. CAMPION; 33, Maude Terrace, Walthamstow, October 2nd, 1909.

LEPIDOPTERA FROM THE ISLE OF ANGLESEY.—I understand that very little is known of the Lepidoptera of Anglesey, and hope that the following notes on collecting done on the north side of the island during the months of April, August, and September may be of interest.

Taking the butterflies first, it may be noted that *P. brassicæ* and *P. napi* are common everywhere, while *P. rapæ* is not so frequently found. Specimens of *E. cardamines* and *C. edusa* have been seen, and some seasons *P. cardui* and *P. atalanta* are common. *V. urticæ* is always abundant, while *V. io* is only occasionally taken. The Fritillaries are represented so far by single specimens of *A. paphia*, *A. aglaia*, and *A. adippe*. On the moors and heaths *S. semele* is abundant, while *P. megæra*, *E. janira*, *E. tithonus*, and *C. pamphilus* are to be found everywhere. *C. phlæas*, *L. astrarche*, *L. icarus*, and *A. sylvanus* are also obtained. The sallows, birches, and alders growing on the heaths are very productive of larvæ, the following being found in greater or lesser abundance: *S. populi*, *S. ocellatus*, *C. furcula*, *D. vinula*, *P. dictæoides*, *N. ziczac*, *N. dromedarius*, *L. camelina*, *N. cucullatella*, *A. leporina*, *S. libatrix*, and *A. betularia* (no example of var. *doubledayaria* has yet been obtained); also *M. rubi*, *M. pisi*, and *A. myrtilli* on the heather; *D. capsicola* feeding on the seed-heads of *Lychnis*; *C. glaucata*, *B. bimaculata* (rare), and *B. temerata* (common), on hawthorn. (It may here be mentioned that a curious variety of *L. camelina* emerged on March 29th, 1908, the right wings being of a pale buff colour, while those on the left are the typical reddish brown.) On hazel the larvæ of *P. bucephala* are found in large numbers, while those of *D. coryli*, on the same tree, are of rare occurrence. Larvæ of *D. pudibunda*, *P. similis*, *M. neustria*, *A. psi*, and *A. rumicis* have also been obtained. In the spring the willow catkins are a great attraction to *P. rubricosa*, *T. gothica*, *T. stabilis*, *T. incerta*, *T. pulverulenta*, *T. munda* (not very common), *T. gracilis*, *X. areola* (a curious chalky-white form), together with *O. vaccinii*, *E. satellitia*, *X. socia* (one specimen), *C. vetusta*, and *C. exoleta*. At the same time of year searching low plants at night produces larvæ of *N. triangulum*, *N. baia*, *N. primulæ*, *N. rubi*, *N. xanthographa*, *T. comes*, *T. pronuba*, *T. fimbria*, *E. lichenea* (feeding on stonecrop on the sand-hills), and

B. lichenaria (on lichens growing on apple-trees). Later in the year numerous moths come to "sugar," and besides those already mentioned as larvæ are *H. derasa*, *T. batis*, *A. segetum*, *A. exclamationis*, *A. ypsilon*, *N. glareosa*, *N. depuncta* (a single specimen), *N. c-nigrum*, *N. brunnea*, *N. plecta*, *T. ianthina*, *E. prasina* (four examples only), *E. occulta* (one specimen), *E. nebulosa*, *B. brassicæ*, *M. oleracea*, *C. graminis*, *C. matura*, *M. strigilis*, *M. literosa*, *M. bicoloria* (rather scarce), *X. lithoxylea*, *X. monoglypha* (ab. *perfusca*, one example), *A. lutulenta*, *P. chi*, *P. meticulousa*, *M. maura*, *N. typica*, *L. pallens* (reddish form), *L. impura*, *L. lithargyria*, *L. conigera*, *C. quadri-punctata*, *M. tragopogonis*, and *X. circellaris*. Flowers are also very attractive—lavender to *A. triplasia*, *H. sylvina*, &c.; sage to *N. umbrosa* and *C. taraxaci*; while ragwort produces plenty of *T. interjecta*, *H. nictitans*, *H. micacea*, &c. A strong acetylene light and a sheet have been the means of obtaining *D. falcataria*, *C. glaucata*, *S. lubricipeda*, *S. menthastri*, *L. lurideola*, *A. agathina* (one specimen), *E. popularis*, *T. cespitis*, *L. testacea*, *S. anomala*, *C. xerampelina*, *A. lunosa*, *A. lychnidis*, *X. fulvago*, *X. flavago*, *P. chrysitis*, *P. gamma*, *H. proboscidalis*, *P. pruinata*, *G. papilionaria*, *H. strigata*, *A. aversata*, *A. bisetata*, *O. limitata*, *C. brumata*, *T. dubitata*, *L. prunata*, *L. testata*, *C. truncata*, *C. siterata*, *C. miata*, *L. suffumata*, *C. ferrugata*, *A. viridaria*, *M. didymata*, *X. montanata*, *X. fluctuata*, *X. sociata*, *P. alchemillata*, *C. bilineata*, *H. furcata*, *A. badiata*, *E. vulgata*, *E. rectangulata*, *A. sylvata*, *A. grossulariata*, *L. marginata*, *L. adustata*, *C. pusaria*, *M. margaritaria*, *E. alniaria*, *S. bilunaria*, *C. bidentata*, *C. elinguaris*, *O. sambucaria*, *O. luteolata*, *E. apiciaria*, *H. marginaria*, *A. æscularia*, *B. gemmaria*, *B. repandata*, and one example of *H. fusconebulosa* ab. *gallicus*; also, on the sand-hills, *P. dictæa*, *A. vestigialis*, *A. cursoria*, *A. tritici*, *A. strigula*, *A. præcox*, *E. lichenea*, *T. fulva*, *G. obscurata*, and *X. galiata*. The following moths have been taken on the wing:—*M. stellatarum*, *C. potatoia* (one specimen on the sand-hills), *O. quadra* (one example; one larva has also been found), *P. interrogationis* (one example on heath), *H. humuli*, and *H. lupulina*. In April the pupæ of *M. thalassina* are abundant under moss on rocks and stone walls, and in August the tall marsh thistles contain the pupæ of *O. ochracea*.

On the whole it may be said that Anglesey is fairly productive of Lepidoptera, much, however, depending on the season.—E. S. A. BAYNES; 120, Warwick Street, S.W.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 6th, 1909.*—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. Hugh Scott, B.A., Trinity College, and the Museum of Zoology, Cambridge, and Mr. Carlton C. Goudey, B.Sc., Uganda, British East Africa, were elected Fellows of the Society.—Sir George Hampson brought for exhibition the unique example of a Noctuid moth new to science, captured in the neighbourhood of Aberdeen by Mr. L. G. Esson, and presented to the National Collection by the Hon. N. C. Rothschild. It would be necessary, he said, to constitute a new genus for it, as it presented characters not known to exist in allied

species.—Mr. A. H. Jones exhibited examples of *Melitæa deione*, from La Grave, and aberrant forms of *M. didyma*, from Digne, taken in July last. This is the first record of the former species occurring so far north in the French Alps, and it is noteworthy that the specimens showed a nearer affinity to the meridional form than to the var. *berisalensis* of the Rhone Valley in Switzerland.—Mr. G. C. Dudgeon sent for exhibition a case containing examples of new and little-known butterflies from West Africa, together with notes and descriptions.—Professor T. Hudson Beare exhibited specimens of the very local and rare *Trechus rivularis*, Gyll., taken at Wicken Fen on September 15th, 1909; also of *Pseudopsis sulcata*, New., taken at Sandown, Isle of Wight, in haystack refuse, in August last. This genus and species were originally described by Newman on specimens taken in the Isle of Wight. The species has never been taken in the island since that date until the present capture.—Mr. H. St. J. Donisthorpe showed examples of the following:—(a) *Tychius polylineatus*, Germ., taken at Ditchling by Mr. Dollman and himself on September 9th; (b) *Trechus rivularis*, Gyll., taken as above; the rare Dipteron (c) *Meigenia floralis*, Fall.; also (d) *Phytodecta pallida*, bred from larvæ taken at Chilworth in July last, with the pupa-case on the larval-skin of the beetle; and the following Braconidæ (e) *Euphorus bistigmaticus*, Morley, n. s. male type bred from *F. rufa* nest from Weybridge, June 15th, 1909; females taken hovering over *F. rufa* nests at Weybridge, July 7th, and Beaulieu Forest, July 21st, all of this year. (f) *Spilomma falconivibrans*, Morley, n. g. et s. male and female bred from *F. fusca* nest from Porlock, July 29th, 1907; and (g) *Pachylomma buccata* female taken at St. Helen's, Isle of Wight, hovering over nests of *Lasius niger*.—Mr. W. J. Lucas showed a male and female example of *Ascalaphus coccajus*, and a pair of the same insect near the var. *leucocilius*, with the golden yellow markings replaced by white. They were taken by the Rev. F. D. Morice, with other specimens, in June of this year, at Geneva.—Mr. G. Bethune-Baker showed a series of *Chrysophanus dorcas*, which occurs in North America from Labrador, and Alaska down to Michigan, in marshy localities, and pointed out the peculiar characteristic of the egg, which is more Thecloid than Chrysophanid. He also exhibited a finely radiated example of *Chrysophanus hypophlæas*; also a North American species.—Mr. G. F. Leigh exhibited the female parent and twenty-one specimens of the offspring of *Charaxes zoolina neanthes*. This result was obtained from ova deposited by the *zoolina* form of the female, and produced four males and two females like the parent, and fifteen males and nine females of the *neanthes* form. Last year the same result was obtained in a smaller degree, but the eggs on that occasion were obtained from the *neanthes* form of the female. Mr. Leigh remarked that although the *zoolina* forms are consistent in both the wet and dry season, there are two quite distinct forms of the *neanthes* variety.—Mr. H. Eltringham, M.A., F.Z.S., read a paper on “Edibility Experiments with Larvæ and Lizards.”—Mr. F. Enock, F.L.S., read a paper on “New British Mymaridæ,” and illustrated his remarks with a number of lantern-slides of both sexes of the species discovered and described by him. The following papers were also communicated:—“On the

Characters and Relationships of the less-known groups of Lamellicorn Coleoptera, with Descriptions of new species of Hybosorinæ, &c.," by Gilbert J. Arrow. "A list of Chrysidids taken by the writer in two visits to Jaffa, Jerusalem, and Jericho, with descriptions of new species," by the Rev. F. D. Morice, M.A. "A Revision of the African Species of the genus *Lycanesthes*," by G. T. Bethune-Baker, F.L.S.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 23rd, 1909.—Mr. Alfred Sich, F.E.S., President, in the chair.—Mr. Tonge exhibited stereographs of the ova of *Nonagria edelsteni* and of *Celastrina argiolus*.—Mr. H. Moore, several species of the genus *Heliconius* belonging to the *Melinæa*-like group.—Mr. Newman, series of *Dianthæcia conspersa* with black forms from Shetland, *D. carpophaga* with white forms from Eastbourne, *Dicranura bicuspis* from Tilgate, *Cucullia gnaphalii* from East Kent, *Cidaria reticulata* from Windermere, *Egeria andrenæformis* from North Kent, &c.—Mr. Barrett, imagines from a species of processionary caterpillar which occurs commonly on the pine-trees of Sicily, and a number of species of Lepidoptera found in his garden at Brockley.—Mr. Prall, dwarf specimens of *Agriades bellargus* and *Polyommatus icarus*, with unusually large examples of *Vanessa atalanta* and *Celastrina argiolus*.—Mr. Joy, a series of *Cyclopides palæmon* bred from ova, Lincolnshire.—Mr. Brown, a curiously banded form of *Cymatophora fluctuosa*.—Mr. Carr, examples of *C. fluctuosa* and *C. duplaris*, and a series of *Boarmia repandata* with var. *conversaria*, from the Wye Valley.—Mr. Cowham, a white specimen of *Rumia cratægata*.—Mr. A. Sich, a pair of the rare *Coleophora chaleogrammella* taken at Richmond on August 14th, 1909.—Mr. Turner read a paper on "Our Authorities," and exhibited a number of volumes referred to, published in the first half of the nineteenth century.—HY. J. TURNER, *Hon. Rep. Sec.*

OBITUARY.

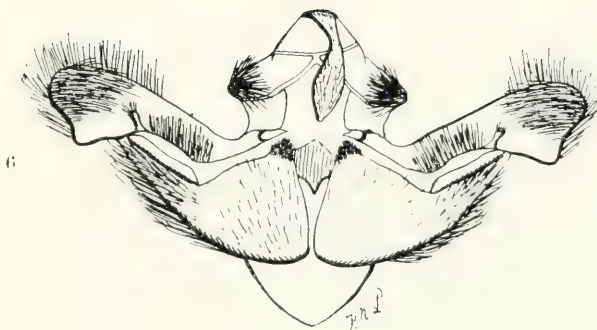
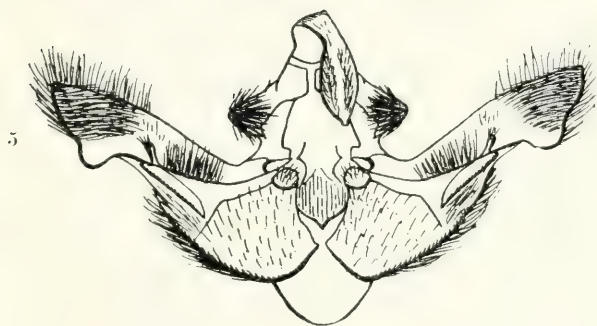
HENRY WILLIAM BARKER, who for some years had resided at 171, Gordon Road, Peckham, died of pleurisy after about a week's illness on the 21st September last at the comparatively early age of forty-nine years, leaving a widow and two daughters surviving.

From 1886 to 1893 Mr. Barker occupied the position of Hon. Secretary of the South London Entomological and Natural History Society. During this somewhat critical period of the Society's existence he proved himself of the greatest assistance, and when he retired from that office in March, 1893, owing to pressure of business, he was the recipient of a written testimonial of thanks from practically every member of the Society.

In the year 1887 he became a Fellow of the Entomological Society.

He was a good type of the hard-working field Naturalist, and got together a nice collection of British Macro-Lepidoptera, mostly taken or bred by himself, and which we understand is destined for "Stevens" at an early date.

T. W. H.



LUPERINA NICKERLII and L. GUENEEI BAXTERI.

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LUPERINA GUENEEI, DBL., AND VAR. *BAXTERI*, VAR. NOV.

BY RICHARD SOUTH.

(PLATE VII).

THE original description of *gueneei* as published in the 'Entomologists' Annual' for 1864, p. 123:—

“*LUPERINA GUENEEI*, H. Dbl., n. sp.

“*Alis pallide testaceis albo nigroque irroratis, strigis duabus ex lunulis confertis nigris, pallide extus adnotis, compositis; ciliis maculatis.*

“*Expansio alarum 1 unc. 5 lin.*

“*Thorax pale griseous, mixed with white. Abdomen very pale. Anterior wings pale testaceous, irrorated with black and white atoms—an indistinct interrupted pale striga before the middle—then a second arcuated striga composed of black lunules, edged externally with whitish; the first striga terminates in a rather conspicuous black dot on the inner margin of the wing, the ordinary stigmata are placed between these strigæ, the reniform one being distinctly edged with white. Between the black dots on the inner margin of the wing and the thorax is a slender black line. Hinder margin pale testaceous, with an indistinct undulating pale line, commencing at a pale patch on the costa near the apex. A distinct row of black marginal lunules, cilia spotted with deep and pale fuscous. On the costa near the apex are two oblique white spots. Posterior wings pure white in both sexes, with black marginal lunules. Antennæ of the male rather strongly ciliated.*”

The late Mr. J. B. Hodgkinson, in a note on *Luperina gueneei*, published in the 'Entomologist' for 1885 (xviii. 54), wrote:—

"In 1860 or 1861, T. Porter (still living) brought me two fine specimens of a moth I did not know. They were of both sexes. I purchased them from him, and sent them on to the Rev. H. Burney, who forwarded them to Henry Doubleday. From him they went to Guenée, and he returned them with the remark that he had a specimen in his collection marked as a variety of *L. testacea*, but he was quite satisfied they represented a good species when he saw both sexes. H. Doubleday then named them after Guenée, as the latter was evidently the original captor. I saw Porter again, and he told me another man, by name H. Stephenson, had one. They took three in all near the ferry at Rhyl, North Wales. I sent Porter again, and went myself, but we failed to find more afterwards. I bought the specimen from Stephenson, and sent it to Miss Sullivan, of Fulham, where, I suppose, it remains. I think it was a female."

Barrett (Brit. Lep. iv. p. 335), in referring to the three North Wales specimens, states that they "were raked from overhanging edges of sandhills."

The foregoing then appears to be all that was definitely known of the British history of *gueneei* up to 1889, in which year Mr. Baxter sent me a specimen which, as already adverted to (*antea*, p. 269), I then thought was a link connecting *gueneei* with *nickerlii*. It was this specimen, Mr. Baxter informs me, that Mr. Tutt described as *Luperina testacea* var. *incerta*, and not the 1891 example. In my remarks on the specimen (Entom. xxii. p. 271) the ground colour was noted as being pale grey. Tutt (Brit. Noct. i. p. 140) describes the ground colour of the fore wings of *incerta* as "greyish fuscous, with a slight ochreous tinge." At the present time the 1889 and the 1891 specimens are both distinctly tinged with ochreous. These two specimens, however, are referable to *L. gueneei*, Doubleday,* a female type of which is in the National Collection at South Kensington. I may add that Sir George Hampson concurs in this identification. The specimens obtained this year are of a rather different form; therefore, as it is largely due to Mr. Baxter's patient investigation that the *Luperina* muddle of twenty years' standing has been cleared up, I propose that this form be known as:—

Var. *baxteri* (Pl. VII., figs. 3 ♂, 4 ♀). — Ground colour paler, and without the ochreous tinge of *gueneei*. The black edging of the whitish transverse lines varies in intensity, but in two of the six specimens this is inconspicuous; the reniform stigma is more or less outlined in white, but this character is less evident than in

* This was from the Burney collection; a co-type was acquired by the late Mr. P. B. Mason from the same collection, and this subsequently passed into the possession of Mr. E. R. Bankes when Mason's collection was dispersed in 1905.

L. nickerlii. The fringes are pale, chequered with dark grey, their tips sometimes dotted with blackish. In two females a blackish bar extends from the claviform stigma to the post-medial line, and in these specimens the area beyond the white submarginal line is pale, almost whitish. White dots on the costa between the post-medial line and the apex are present in some of the specimens. Expanse, ♂ 32-34 millim.; ♀ 36-38 millim.

The following is an abstract from Mr. Baxter's note sent with the insects referred to above:—

"In 1891 I captured a second specimen of the *Luperina* thought to be a form of *nickerlii*, but from that time until the present year I had not been lucky enough to see any others. This was chiefly, perhaps, because I had not been working in the right kind of place. This year a friend of mine and brother collector, Mr. W. Yates, while out with me one evening, came across a *Luperina* which, on his showing it to me, I at once recognized to be the same species as my two previous captures. Since then I have taken six, and I believe Mr. Yates has taken five or six more. Some entomologists who saw the first specimen seemed to think that it was an immigrant, but this year's experience completely disposes of this, as I found one evidently just emerged, as it had a small piece of the pupa-case adhering to it, and on another occasion I found one drying its wings. Mr. Yates also found one drying its wings. I also found a crippled female which was certainly incapable of flying from the Continent; all which conclusively proves, I think, that the insect is British. The moths were not found all on one spot, but nearly two miles apart.

"All that Mr. Yates and I have found are similar in character to the 1889 one, and although they vary slightly in the depth of colouring, all are bright silvery grey, with very little trace of ochreous, except one, a rather worn male, which I have sent to Mr. Pierce, of Liverpool, who has kindly undertaken to examine the genitalia; this one was slightly more ochreous than any of the others. At the first glance the specimen might almost be taken for the light grey form of *Agrotis ripæ*. This *Luperina* is decidedly a coast insect, and I have only seen one *L. testacea* where it is found."—T. BAXTER; Min-y-don, St. Anne's-on-the-Sea, Lancs.

In addition to the ochreous specimen mentioned in his note, Mr. Baxter forwarded a second example to Mr. Pierce, whose report thereon is appended:—

"I have examined nine specimens of *Luperina testacea*, all of which are exactly similar, and two specimens of a new species which agree *inter se*, but differ from *testacea* in five very distinct points as follows:—

TESTACEA (Pl. VII., fig. 6).	NEW SPECIES (Pl. VII., fig. 5).
Harpe angulated, without corona, apex <i>rounded</i> .	Harpe angulated, without corona, apex <i>bluntly pointed</i> .
Clavus angulated to a point, <i>densely clothed with short hairs</i> .	Clavus roughly rounded, smooth, with a <i>few scattered hairs</i> .
Uncus cygnated.	Uncus cygnated, <i>larger than testacea</i> .
Ædæagus scobinated, with <i>four rows of teeth</i> at the junction of the vesica, these narrow to two rows along the vesica, then extend in a double line towards the opening.	Ædæagus scobinated, with a <i>double line</i> of teeth rising from the junction of the vesica towards its opening.
Vesica with a number of <i>small</i> cornuti.	Vesica with a number of cornuti <i>larger than testacea</i> .

"I have therefore no hesitation in pronouncing these light specimens to be absolutely distinct, and apparently constant. Whether they are identical with the *Luperina nickerlii* of Freyer or not I am at present unable to say, as I have so far failed to obtain specimens of this species for examination." — F. N. PIERCE.

Since the above report was communicated, Mr. Pierce has obtained a pair of *nickerlii* from Messrs. Watkins and Doncaster. I also sent him a male specimen from Bohemia that I received, together with an example of the female, from Hermann Rolle, of Berlin. I, too, have a male specimen through the same source as Mr. Pierce.

Examination of the genitalia is not yet complete, but so far as it has gone Mr. Pierce has decided that *nickerlii* is not the same species as the Lancashire *Luperina*, and he is further of opinion that *nickerlii*, as represented by the specimens he has, may prove to be a form of *L. testacea*. *L. gueneei* then will stand as a distinct species, and the status of *nickerlii* must await the result of further examination. In the meantime I present, on Plate VII., figures of two of the *nickerlii* that I have. Fig. 2 represents a male which was in an old collection in Vienna, and was originally taken by Herr Nickerl, in the neighbourhood of Prague, about fifty years ago. Fig. 1 shows a female specimen from Bohemia. The ground colour of all the specimens is brownish grey suffused with deeper brown; this suffusion is deeper in the male figured than in the female. The male sent to Mr. Pierce agrees in colour with the female figured.

Concerning the distribution of *nickerlii* very little is known; it has been recorded from Germany and South France, but its home seems to be in Bohemia. *L. gueneei* appears to be almost exclusively British.

NATURAL ORDERS OF INSECTS.

BY W. J. LUCAS, B.A., F.E.S.

THOSE who are interested in any group of insects coming within the Neuroptera (*sensu lato*) will welcome Dr. Sharp's pronouncement in last month's 'Entomologist' on an arrangement of the Natural Order of Insects that falls in line with present-day opinions. At first sight the list seems somewhat revolutionary. A second glance, however, shews that the changes from the well-known nine are really slight. They are mainly two: (1) Breaking up the old Neuroptera into the parts, which everyone who has had to do with them has always recognised, and which many have long been accustomed to consider distinct orders. (2) Placing together and giving ordinate rank to three groups of apparently degenerate, but at any rate distinct, insects, about which perhaps further may be learned in the future. The old Apterata comprising the first three orders in the new list differ so much from one another that probably if they had their due they should be still further sub-divided; but their numbers are so few that in practice this is unnecessary. For the orders containing normally winged insects it seems well to adopt names ending in *-ptera* if possible; perhaps it might be wise to do the reverse with the rest. This could be done with very little change in nomenclature, except in the case of the Siphonaptera and Odonata.

THE DRAGONFLIES OF EPPING FOREST IN 1909.

BY F. W. & H. CAMPION.

NOTWITHSTANDING the deplorable weather, we collected during the past season as many as fifteen species of Odonata in the Epping Forest district; none of these, however, were new to our local list. It will be noticed from the following remarks on the species observed that exceptionally late dates were recorded for *Pyrrosoma nymphula* (August 15th), *Agrion puella* (September 12th), *Cordulia ænea* (August 4th), *Erythromma najas* (August 4th), and *Anax imperator* (August 15th).

(1) *Pyrrosoma nymphula*.—Immature specimens were met with plentifully on May 9th, at which time females preponderated greatly over males. By May 23rd pairs were flying in couple and ovipositing. Teneral individuals occurred as late in the season as June 13th, and the species continued in flight until Aug. 15th at all events, on which date an aged male was taken. This is the latest date for *P. nymphula* within our experience, although we have previously taken it in August (August 1st, 1904). The form of the female named *fulripes* was taken on May 9th, 16th,

and 30th, and August 8th. The last-named specimen was very small, as it attained no more than 32·5 mm. in length and no more than 43·5 mm. in expanse.

(2) *Agrion puella* was not met with until May 23rd, when some mature males were taken. The period occupied by the emergence of the various individuals was an unusually protracted one, swarms of immature examples occurring at some of the ponds as late as May 30th, and the species was still emerging on July 4th. On July 18th quite a remarkable series of melanic males was obtained from one small pond; the additional black spots were mostly irregular in shape and position, and the different specimens varied in the amount of melanism exhibited. A male was taken in another part of the Forest with the moth *Tortrix viridana* in its clutches: we made an identical observation on June 28th, 1908. Again on July 18th a female had her abdomen thickly encrusted with mud, and it was inferred that she had been ovipositing in wet clay. On August 29th a female was obtained with the green ground-colour becoming blue; the blue was strongly marked at the wing-bases and on segments 1 and 2. Females with cuneiform green or blue spots on segments 3 to 6 were taken on May 23rd, July 4th and 18th, and August 22nd. A solitary male, in fine condition, was obtained as late as September 12th: this date is eleven days later than our previous latest date for the species (September 1st, 1903).

(3) *Ischnura elegans*.—When the species was first met with (May 23rd), it was already in mature condition, but an immature male occurred as late as August 4th. The female form called *rufescens* was taken on July 4th, and the form distinguished as *infuscans* on July 4th and September 5th. The female having segment 8 coloured as in *infuscans*, but having the humeral stripes on the thorax obsolete, was obtained on August 4th.

(4) *Cordulia ænea*.—The earliest capture was made on May 23rd, when the specimens come across showed a strong disposition to fly about the tree-tops. The species remained on the wing an unusually long time, and males were taken on July 18th, and another was observed in flight as late as August 4th. Females were, as usual, seldom seen, and only one capture could be effected (June 13th). The total length of this example was 48·5 mm., and the alar expanse 68·5 mm.

(5) *Libellula depressa*.—The flight of this dragonfly was observed to extend from May 23rd to August 4th.

(6) *Brachytron hafniense* (= *pratense*).—An evacuated nymph-skin, referred to this species, was obtained on May 23rd. The first imago was taken on May 30th, when as many as five specimens were seen. The insect was taken again on June 13th. An examination of several fresh specimens caught during the year showed that the current description of the colours of *B. hafniense* needs amendment or amplification in these re-

spects:—♂: The following parts are apple-green, not yellow—longitudinal stripes on thorax, sides of thorax and of segment 1, wing-bases and prominences between them. ♀ (Adult): Eyes blue above and brown below; sides of thorax and of abdomen apple-green.

(7) *Erythromma naidas*.—Two freshly emerged females taken on May 30th exhibited a dull-green coloration, with purple-bronze on the upper surface. The eyes of some fully adult females taken on August 4th were noted as being reddish-brown above and yellowish-green below. One specimen was very small, its length being only 34.5 mm., and its expanse only 45 mm. It is interesting to compare this female with an unusually large one netted in the same locality on June 14th, 1908 (length 38 mm., expanse 51 mm.).

(8) *Enallagma cyathigerum* was not observed until August 4th. On August 15th a blue female was obtained, as well as a male having the spot on segment 2 entirely disconnected from the circlet behind. A male caught on September 12th was discovered to have prey in its jaws, which turned out, upon examination by Mr. Charles O. Waterhouse, to be portions of a gnat (*Culex* sp.).

(9) *Anax imperator* was first seen on August 4th, and a male was taken on the 15th of the same month.

(10) *Aeschna grandis*.—On August 4th a newly emerged female was found and mature specimens were seen in flight. On August 8th and 29th females were busy ovipositing.

(11) *Sympetrum striolatum*.—On August 4th, when the species was first met with, a fully-matured male was found, as well as teneral specimens. A partially consumed insect, determined by Mr. Waterhouse as the remains of a Muscid fly, was extracted from the jaws of a male taken on September 5th. The last specimens, a male and female, were taken on October 24th.

(12) *Calopteryx splendens*.—A visit was paid to the River Roding on August 15th, and a fine male of this species was secured; a female was also seen, but not taken.

(13) *Aeschna cyanea* was taken for the first time on August 15th, and for the last time on September 12th.

(14) *Sympetrum sanguineum*.—Three males were obtained on August 29th. One of them was of the largest size, and another was exceptionally small, measuring only 30.5 mm. in length, and 49 mm. in expanse of hind wings. Some of the males taken this year, like others taken in previous years, show the strongly marked constriction of the abdomen, at the suture between segments 8 and 9, seen in Charpentier's figure of his *Libellula nigripes* (= *sanguineum*, Müll.).

(15) *Lestes sponsa* was found to be present in some numbers when Coopersale Common was visited on September 7th. In view of the Abbé Pierre's discovery of the gall-making habit of

L. viridis, a prolonged search was made among willows and other plants growing near the water for any similar gall-like swellings of the twigs caused by *L. sponsa*. There was, however, nothing to indicate that the remarkable habit referred to is shared by the British insect.

A. puella, *I. elegans*, *E. cyathigerum*, *Æ. grandis*, *Æ. cyanea*, *S. sanguineum*, and *L. sponsa*, were all taken for the last time on September 12th.

Larval water-mites (Hydrachnidæ) were observed upon *P. nymphula* (May 9th and 16th), *A. puella* (May 23rd and 30th, and June 13th and 20th), and *E. cyathigerum* (August 29th). In most, if not in all, of these cases the parasites were confined to the sternum of their host.

33, Maude Terrace, Walthamstow: Oct. 31st, 1909.

CURRENT NOTES, 1909.

By G. W. KIRKALDY.

1. BÖVING, A. G.: "Bidrag til Kundskaben om Donaciin Larvernes Naturhistorie" (Copenhagen: 1906—summary by Buseck, P. E. S. Washington, xi. 73-5 (August 31, 1909). Coleoptera.
2. FERNALD, H. T.: "A New Treatment for Wireworms," J. Econ. Ent. ii. 279-80 (August 16, 1901).
3. FORBES, W. T. M.: "On certain *Pieris* Caterpillars," Psyche, xvi. 69-75, figs. 1-9 (August, 1909). Lepidoptera.
4. GERHARD, W. P.: "Additional Bibliography on Flies and Mosquitos as Carriers of Disease," Ent. News. xx. 207-211 (May, 1909). Diptera.
5. KERSHAW, J. C. W.: "On the Metamorphoses and Anatomy of the Reduviid Bug, *Sycanus croceovittatus*, Dohrn," A. S. E. Belg. liii. 241-9, figs. 1-11 (July 2, 1909). Hemiptera.
6. SCHARFF, R. F.: "On an Early Land connection between North and South America," Amer. Nat. xliii. 513-31 (September, 1909).
7. SILVESTRI, F.: "Sguardo allo stato attuale dell' Entomologia agraria negli Stati-Uniti del Nord America e ammaestramenti che possono derivarne per l'Agricoltura Italiana," Boll. Soc. Agr. Ital. xiv. no. 8, pp. 1-65 (April 30, 1909). [Abstract in "Hawaiian Forester and Agricult." vi. 287-336 and 279-86 (August, 1909).]
8. SITOWSKI, L.: "On the Inheritance of Aniline Dye," Science xxx. 308 (September, 3, 1909). Lepidoptera.
9. VAN HORN, R. W.: "[Biological] Notes on some of the Eucnemidæ of the Eastern States," P. E. S. Washington, xi. 54-61, pl. iv. and textfs. 3-4 (Aug. 31, 1909). Coleoptera.

Sitowski (8) publishes a brief note on his experiments in giving wool together with an aniline dye ("Sudan III.") to the caterpillars of *Tineola biselliella*, causing their bodies to be coloured red, the adipose tissue being the most intensely stained. The pupæ and moths resulting continued to preserve the typical red colour. There was an accumulation of dye in the ovary, and the eggs were also stained.

Fernald (2) advocates tarring the seed of maize, then placing it "in a bucket containing fine dust and Paris green mixed in such proportions that the corn [maize], after being shaken up in the bucket, showed a greenish colour." The treatment is doubtless applicable to other seeds.

Silvestri (7) gives an exceedingly interesting detailed report on his observations on a tour to investigate economic entomology in the United States. A translation of the principal part has appeared in the 'Hawaiian Forester.'

Busck (1) gives a summary of Böving's researches on the life history of the Donaciidæ.

The caterpillars investigated by Forbes (3) were *daplidice*, *rapæ*, and *brassicæ*.

The other titles are self-explanatory.

SOME AUGUST BUTTERFLIES OF CANTAL AND LOZÈRE.*

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from p. 269.)

Looking through my old entomological note-books, I find that when in 1901 I visited the northern parts of Lozère, in company with Mr. A. H. Jones, I scarcely did justice to the possibilities of Mende and the surrounding mountains.† On that occasion we arrived there from the Gorges of the Tarn the last week in July, and the weather was most unsettled; the two days' collecting afforded, therefore, but a very poor idea of the pro-

* *Ab. escherinnus*, n. ab.—Since writing the above, and the publication of the figures at p. 267, I have discovered among the females of *P. escheri* in my collection a magnificent example taken at St. Martin-Vésubie, July, 1902, corresponding to the aberration of the male taken in Lozère. Under side: ground colour rich fawn-brown; antemarginal spots, upper wings, reduced irregularly, two only on the right, one on the left wing; lower wings, antemarginal spots, left wing, wholly obsolete; right wing, one very small near the anal angle.

† The first mention I can find of Mende as an entomological centre is to be found in a paper by M. C. Oberthür, included in the Ann. Soc. Ent. France, 41 sér. tome iv. 1864, pp. 181-194, entitled "Excursion Entomologique dans le Lozère," which gives some account of the butterflies met with, but chiefly deals with the fauna of Florac further south.

fusion of butterfly life at this particular central spot of France, which in so many respects preserves the characteristic flora and fauna of the Midi. In the earlier weeks of the summer I have no doubt that it would well repay my "palearctic" friends who spend their holidays each year in the better-known departments of the south and south-east to investigate Lozère, and in the last nine years the lines of approach have been greatly extended. Mende, then but to be reached by the tortuous, dilatory trains of the west, is now in direct touch with the P. L. M. from la Bastide, on the Paris-Nîmes line. Florac has been linked up by a new branch of the same line from St. Cécile d'Andorge, and will benefit immediately by the new clean hotels which have, I understand, superseded the unclean hostels of a more primitive era. Recognizing, therefore, that the season was now far advanced, and anxious to maintain a decent altitude in consequence, on August 6th I took train for Mende, *en route* passing over the Garabit viaduct, once famous as possessing the longest span of any bridge in Europe. With every hour thence the landscape took on some pleasant feature of the south; the volcanic soil disappeared, and presently in its place the cuttings and little hills displayed the unmistakable limestone formation dear to the heart of the entomologist.

After the cool, unproductive green country of Cantal, the change to the limestone hillsides of Lozère was welcome indeed. For the slopes of the Causses, however barren and wind-swept the plateaux themselves, are a feast of colour and flowery luxuriance where they fall to the valleys. As I have so often observed elsewhere in the higher alpine regions of Central Europe, the most favourable haunts for butterflies are the deep inset gullies which reach as a rule from summit to foot of the escarpments, and in spring, when the snow melts, are the water-courses by which the upland levels are drained, and the torrents carried off from the mountains. On the cloudless, still August morning of the 7th the lavender was in full bloom, the air musical with the sound of myriad insects, and every spire of fragrant bloom alive with countless butterflies—the rearguard for the most part of the seasonal broods. Occasional small forests of Austrian fir have sprung up, testifying to the skill of the department which is working with such success to reafforest the dry uplands of France, while here, there, and everywhere grows a species of *Rhamnus* which serves for *Gonopteryx cleopatra* and *G. rhamni*—taken together on the 9th—one male only of the former, and a female which might have belonged to either species; the male of *rhamni* being decidedly common on this and succeeding days. *Anthyllis*, the great white *Medicago*, and innumerable *Papilionaceæ*, seldom seen upon the volcanic formation at le Lioran, all suggested Lycanid visitants, as well as the cytisus and laburnum trees, now laden with red-green pods.

Here also were the prickly blue thistles to lend a decidedly meridional touch of colour among the lavender; while the scanty hedges which divide the cultivated lucerne and sainfoin fields of the main valley of the Lot from the stony approaches to the Causse were hung with scented clematis, with a dense underwood of wild gooseberries, exuberant of thorns, but jewelled with tiny luscious gold and crimson fruits—welcome dessert to the *al fresco* luncheon in a land where no water is to be found. The butterflies about were largely composed of Satyridæ; *Satyrus aleyone* perhaps the most in evidence, but *Hipparchia semele* and *circe* running it close in point of numbers. *S. hermione* was hardly less abundant with *briseis*, chiefly males, and just coming on in full force. But for sheer beauty of colour they had no chance with *Pyrameis atalanta* and *P. cardui*, whose folded wings as they banqueted blended in perfect harmony with the delicate pearly greys and lilac shadow of the lavender.

On this well-remembered ground nothing is more curious than the extraordinary localization of species. I recall having taken *Thymelicus actæon* in 1901 at a certain corner where there was a little waste of scrub and rushes. The bushes had grown considerably, but the intervening spaces provided me with half a dozen examples or so, and precisely the same rule appeared to govern the limitations of *Polyommatus dolus*, for neither was to be taken, now or then, outside these curiously restricted areas, though by walking the whole way to Balsiège along the Causse I struck several colonies of the lovely and little-known "blue," which, taking the form var. *vittata*, Oberth., and extending from the Atlantic slope of the Lozère Mountains, seems, at Ytrac and Aurillac, in the valley of the Cère, to reach its north-western limit in France, though the discovery of the species at Aguessac (Aveyron) by M. René Oberthür's collector may continue the "life-line," so to speak, further south-west than at present suspected. The first day I was on the *dolus* ground at Balsiège—a dry torrent-bed, filled with lavender, white melilot, wild mallow, and other herbs, about half a mile towards Mende from the village—I arrived at noon, but the sky was temporarily clouded, with high wind, and it was not until four o'clock that I suddenly espied a wasted male flitting in company with some beautifully fresh *P. corydon*, ab. *aurantia*, to which, on the wing, it bears a close resemblance. Evidently I was too late by a good ten days, and of the eight or nine males selected but two have attained to "cabinet rank"! As for the females, to separate the which from *P. damon* is a standing entomological puzzle, not one could I discover. Yet one would have expected a few surviving with the last of the males, for they were flying here nine years ago in profusion. In vain I searched the scanty sainfoin patches which are its habitat. I could find only males of *P. damon*, with occasional flashes of *P. hylas*, surely one of

the most exquisite of *Lycænids*, if not as variable in the depth and quality of its colour as another very common Causse member of the family, *P. escheri*; *escheri*, indeed, appearing to exhaust the whole gamut of the colour tones we describe loosely as "blue." The most usual, I suppose, is the rather mazarine-tinted form of the French Alps; then there is the deep steely-blue form with dark suffused borders from the Simplon, while examples from Bosnia exhibit the silky azure familiar in our alternative form of *bellargus*. On the under side it appears to be among the most constant of the "blues," but this year at Mende, where it occurred always in great abundance—and I even netted a few females from plants of *Anthyllis*, though I never found the sexes flying together—I took one male (figured, p. 267), which in general appearance of the under side is not unlike that of the form of *C. var. gordius*, ab. *midas*, Lowe; the antemarginal spots have entirely disappeared; the discoidal spot is large and pronounced. We might venture to call this ab. *escherinus*, new ab., I think, though perhaps it is commoner than I suppose, for I have seen a similar aberration from Bérissal in Mr. W. G. Sheldon's collection. Another distinctive form of *Lycænid* in Lozère is the female *P. alexis*, which reproduces in miniature the warm, rich, uniform brown upper side and continuous orange-spotted marginal bands of the lovely and larger unnamed summer race from Ajaccio, which I should like to denominate ab. *flavocinctata*, though I fancy, so far as Corsica is concerned, accepted as a form of *P. alexis*, it will some day be differentiated from the type as a constant variety at the least.

Meanwhile a few battered *P. baton* were sharing the little patches of wild thyme with *Thecla spini* and *Epinephele lycaon*, the latter worn but still in countless profusion. Nor was *Parnassius apollo* by any means rare—a fine form—the best capture I made being a magnificent female = ab. *nevadensis*, Obth., three and three-quarters of an inch from apex to apex of the extended wings, on which the normal red spots are changed to a brilliant orange-yellow. The piece of waste on which I took *nevadensis* was, indeed, an ideal hunting-ground. It is situated on the slope of the Causse, a point about midway between Mende and Balsiège, where the railway crosses the road near a lonely farmhouse sort of inn, which provided me with the requisites for a sufficient *déjeuner* in a vine-clad harbour—bread and butter of the best, a cheese rather suggestive of Dorset "blue vinny," sardines, and light beer in bottles cool, and the veriest nectar for these burning August days. Above the lane the hill rises abruptly through "garrigues" (abandoned vineyards), well provided with sweet-smelling herbs and the universal lavender; and here, after eight years, I resumed acquaintance with the dainty *Zygæna sarpedon*, the rarest of its kind hereabouts, flying briskly

in the sunshine with *Z. carniolica*, *Z. fausta* var. *faustina*, *Z. hilaris*, and, more rarely, *Z. loniceræ*, *fausta* being perhaps the most active, and all in good order. Both *Colias edusa* and *C. hyale* were also plentiful, and *S. cordula*, quite fresh, showed conspicuously with their dark velvet wings on the daisies, which still supported a few *Melanargia galatea* ab. *leucomelas*, decidedly commoner than the type, though invariably too broken for the collecting-boxes. Fritillaries were few and far between: *A. adippe*, *A. aglaia*, and *A. niobe* var. *eris*; *A. selene*—one almost unrecognizable example—with *M. athalia* and *M. didyma*, were only “occasionals”; *Cænonympha dorus* very common, but all shabby fellows, and almost vanished before the week I spent on Causse was finished. I may add that the ‘Hôtel des Voyageurs’ at Mende offers good accommodation (in the *dépendence*), and the abundant fruit supplies and trout from the Lot (by the banks of which charming river I found *Papilio machaon* one sunny morning in some numbers) afford the *chef* opportunities of which he is not slow to take advantage. Seven francs a day for a good room and full *pension* reminds one of the palmy days of Switzerland as we remember it thirty years ago, with an infinitely better cuisine included; and prices generally in this part of France rule decidedly low, even small tips being received with civility and gratitude.

Leaving Mende on the 14th, I passed the night at Bort (Corrèze), a small town prettily situated on another good trout-stream, the Upper Dordogne, and having a couple of hours before the Paris train left, though it was tropically hot I strolled up towards the forests which encircle the perpendicular cliffs known as the Orgues de Bort, but, with the exception of *Dryas paphia*, *Leptosia sinapis*, *Melitæa parthenie*, and abundant *E. tithonus*, I saw nothing on the wing; and next morning found me back at Paris, where the short spell of August summer was already at an end. From all accounts the weather from June onwards in France north and south was abnormally cloudy and wet, and this no doubt accounted largely for the meagre results of my collecting this year. But I think it worth remarking that at le Lioran the extraordinary flights of dragonflies in general and of *Anax imperator* in particular may have assisted to exterminate the already none too plentiful Rhopalocera. Often did I come upon a likely corner to find a couple of these fine insects in possession, and as they remained hawking over the flowers and low shrubs it appeared as though the butterflies instinctively dropped to the earth or took to covert. At all events, when *Anax* was about I had extremely poor luck with the Order of which I was in search.

Of the Mende butterflies taken or observed by me the following is a complete list:—

HESPERIIDÆ.—*Carcharodus alceæ*; *Hesperia carthami*, *H. alveus* var. *cirsii*, *Pyrgus sao*, *Pamphila sylvanus*, *P. comma*, *Thymelicus actæon*, *T. lineola*, *T. flavus*.

LYCÆNIDÆ.—*Chrysophanus alciphron* var. *gordius*, *C. phlæas*; *Polyommatus damon*, *P. dolus*, *P. corydon*, *P. bellargus*, *P. hylas*, *P. escheri*, *P. alexis*, *P. astrarche*, *P. baton*; *Rusticus argus*, *L.*; *Celastrina argiolus*; *Zephyrus betulæ*; *Thecla spini*, *T. ilicis*, *T. acaciæ* (one).

PAPILIONIDÆ.—*Papilio machaon*; *Parnassius apollo* and ab. *nevadensis*; *Aporia cratægi*; *Pieris brassicæ*, *P. rapæ*, *P. napi*; *Leptosia sinapis*, and ab. *erysimi*; *Colias hyale*, *C. edusa*; *Gonopteryx rhamni*, *G. cleopatra*.

NYMPHALIDÆ.—*Argynnis aglaia*, *A. adippe*, *A. niobe* var. *eris*; *Brenthis selene*, *B. daphne*, *B. dia*; *Melitæa cinxia*, *M. didyma*, *M. athalia*, *M. dictynna*; *Pyrameis cardui*, *P. atalanta*; *Vanessa io*; *Aglais urticæ*; *Eugonia polychloros*.

SATYRIDÆ.—*Pararge mæra*, *P. megæra*; *Satyrus hermione*, *S. alcyone*, *S. circe*, *S. actæa*; *Hipparchia briseis*, *H. semele*; *Epinephele jurtina*, *E. lycaon*, *E. tithonus*; *Cænonympha arcania*, *C. dorus*, *C. pamphilus*; *Erebia neoridas*; *Melanargia galatæa*.

Dryas paphia and *Melitæa parthenie* I did not observe after the 7th, except in the neighbourhood of Bort.

Harrow Weald: September 20th, 1909.

SIX WEEKS AMONGST HUNGARIAN BUTTERFLIES.

BY W. G. SHELDON, F.E.S.

(Concluded from p. 276.)

SHORTLY afterwards, the storm having ceased, I proceeded towards the hotel, to which I had only gone a few yards when another example was observed on the trunk of a tree. This was rendered practically torpid by the hail, and allowed me without difficulty to scrape it into the net, the only instance in which I succeeded in effecting a capture by this method.

The first example was taken on June 19th, after which I did not see another until June 25th, on which day two were taken; after this date, until I left Herculesbad, a few were taken each day, the total amassed being fourteen fine specimens, all males, and which I suppose involved about as many hours' work. I believe *P. roxelana* is in some years quite abundant in the Kreuze wood; but it certainly was not so in 1909, and except at two spots I did not see more than three or four examples each day. At each of those exceptions grew a large oak tree, the upper parts of which were dead and preyed upon by various insects, chiefly the larvæ of Coleoptera, and no doubt it was the

frass exuding that was the attraction to butterflies; on these trees every time I passed some five or six *P. roxelana* were to be seen; but, except on one occasion when I netted two of them, they refused to come within reach, and, if disturbed by stones, flew away. I saw two examples at the top of the Coronini wood, one of which I captured. When not disturbed *P. roxelana* has a typically satyrid flight, and is much like in appearance a large *P. mæra*, which haunts the same localities at the time of its emergence: when alarmed it makes a headlong rush through the surrounding trees and undergrowth, usually straight uphill or straight downhill, and on such ground as it frequents it is quite useless to pursue it if missed at the first stroke. I did not see anything that I could consider looked at all like *Pararge climene*, and I was told by Professor Schmidt that this species, for which Herculesbad was noted, has not been seen there for the last ten years.

The handsome *Syntomis phegæa* was very abundant at Herculesbad, contrary to the usual habits of the Zygænidæ, frequenting chiefly the shade of thick woods; on one occasion I observed an unusual instance of assembling with this species, sixteen males of which were flying and crawling round a space of a few inches on a bank in a wood. On looking for the cause I found a crevice partly filled with a spider's web, and in it, in the clutches of a large spider, an unfortunate female of *S. phegæa*. Other Zygænidæ noticed here were *Zugæna filipendulæ*, *Z. trifolii*, *Z. scabiosæ*, *Z. carniolica*, and *Z. achilleæ*. A quite unexpected and gratifying sight at dusk was the quantities of fireflies which frequented the banks and woods. I captured a few of these, and found they were the male of a Coleopteron, *Luciola mingrellica*, very similar in size and general appearance to the male of our own glowworm. The light was not continuous, but as the insect flew along, at intervals of about three seconds, it had the power to cause a flash like that of an electric spark, and a very bright one, to issue from the under side of the anal segments of the abdomen. I was told that the majority of Hungarian entomologists were coleopterists, and when one sees the magnificent coleopterous fauna of that country one is not surprised; the Longicorns and rose beetles were especially grand, one species of the former, which was not uncommon, was as large as our stag beetle, and had antennæ at least three inches in length.

I left Herculesbad for Budapest *en route* for the Hohe Tatra on July 1st, Mr. Tylecote having returned to England a week previously. A rather quaint incident arose in connection with the visitor's tax. This is payable by all who stay in the Bad for more than five days; the amount, varying from 2 to 24 kronen, is assessed by the local authorities on their views as to each person's means and position; the evidence on which they proceed being contained in the form which all visitors are asked to fill up

immediately on their arrival, and which includes their occupation. I filled mine in without any thought of the result, but on my fifth day found myself called upon to pay 16 kronas, whilst my friend, who is fortunate enough not to have an occupation, got off for 8 kronas. I strongly protested at this manifest injustice, but was met by the argument: "But you put yourself down as a 'director.'" I hastened to explain that however dignified such an occupation might be in Hungary, in England there were plenty of very poor directors; but it was of no use, I had to pay the 16 kronas, and to console myself with thinking that some at least of my entomological predecessors visiting Herculesbad had paid considerably more.

The Hohe Tatra is that portion of the great chain of mountains, the Carpathians, which rises out of the plain north-east of Budapest, at a distance of some 140 miles as the crow flies; it is the highest portion of the chain, rising in some of its peaks to an altitude of nearly 9000 ft., and although not covering a large area—which I suppose may measure roughly twenty miles by ten—it contains some of the finest mountain scenery to be found in Europe. Strange to say, in spite of this and that it also contains some of the best hotels I have seen anywhere in Europe, the Tatra is very little known to British tourists, and hardly at all to those of us who are entomologists. For although I happen to know that one or two British lepidopterists have visited it, there do not seem to be any published reports in English of the insect fauna of the region; at least I have been unable to discover any, though of course it is well known to the Hungarians, and in a lesser degree to the Germans.*

It was therefore with considerable curiosity and anticipation of something interesting that I proceeded thither. Unfortunately during my stay of eleven days, from the 3rd to the 13th of July, the weather was the very worst I have ever experienced in continental Europe, and I was only able to get amongst the alpine species on two occasions; on the first I only had a few minutes' sunshine, and on the second occasion, although there was a fair amount of it, the temperature was so low I did not see a single butterfly on the wing. Eventually, after several days of almost continuous rain and mist, I had to give it up and come away.

The Tatra from the treeless plain, which has an altitude of about 2000 ft. up to about 5000 ft., is thickly covered with forests of spruce; the hotels, of which there are a number, are principally scattered about these forests at an altitude of about 3000 ft. The climate is much colder than at a corresponding level in the Alps, and the whole district reminds one forcibly of some parts of Scotland. The mountains are chiefly of a granite formation, though in the east

* Cf. 'Iris,' vol. xiv, p. 365, *et seq.* [H. R.-B.]

there is a limestone range. The flora is a most interesting one, including many species familiar in the garden at home, especially of the *Campanula* group, whilst the great stretches of *Spiræa aruncus* in the forest glades are among the finest natural floral effects I have seen. The cold climate and abundant rainfall is accountable no doubt for the rather scanty insect fauna, as compared with other parts of Hungary; and the specimens, though many of them are very interesting, have a tendency to run to obscurely marked forms and small size. I speak of the sub-alpine species, for it was only amongst these that I was able to make any observations.

I arrived at the Palace Hotel, Tatra Lomnitz, about 7 a.m. on the 3rd July, after travelling all night from Budapest; the rain which had descended continuously for thirty-six hours was still in evidence, and after selecting a room and having a conversation with the manager, during which he imparted to me the cheerful intelligence that it had rained off and on for the last three weeks, I decided to get some sleep. Awaking about noon I was delighted to see that the sun was shining, and after partaking of lunch sallied forth. I may mention here that the ground immediately around the Palace Hotel, "Nagy Szálloda," in Magyar, especially on the side nearest Tatra Fured, is the best I could find in the Tatra. Leaving the hotel I bore to the left, and found myself in a grassy ride running through the spruce forest, with seats at intervals, and plenty of flowers; here butterflies were quite abundant, the first one netted being *Erebia medusa* var. *hippomédusa*, perhaps the most abundant species met with in the Tatra, and occurring everywhere I collected. *E. ligea* var. *adyte* was not infrequent, and equally widely spread; a dark form of *Cænonympha iphis*, with the ocelli on the under side strongly developed, flitted here and there; and around a swampy spot covered with rough tussocky grass I saw a *Cænonympha* of slightly different flight and somewhat browner tint; netting this I was delighted to find I had run to earth a butterfly taken by but few Britishers—*C. hero*; this species, which had evidently been out some time, was widely spread on the granite, wherever swamps covered with the rush-like grass were to be found. A flight familiar, but not seen for years, was that of *Carterocephalus palæmon*, of which I came across a few specimens each day. I was surprised also to meet with *Chrysophanus hippothoë*, type, and with no approach to the mountain form var. *eurybia*; the females had a fair amount of copper on the upper side, and the males well marked dark margins to the wings, and in one or two of them the inferiors are more strongly shot with purple than any specimens I have seen. Perhaps the most interesting species I took in the Tatra was a *Melitæa* with the upper side as dark as *M. dictynna*, but which has an under side very suggestive of *M. aurelia*, which the Rev. G.

Wheeler, who has seen the specimens, informs me are the *M. var. ? dictynnoides* of Hornmuzaki, included by Staudinger in his Catalogue as a var. of *M. aurelia*, but which Mr. Wheeler believes to be a distinct species, an opinion receiving support from very typical specimens of *M. aurelia*, taken at Tatra Lomnitz, for which I am indebted to Baron Vecsez. The dark Hungarian form of *Pararge mæra*, which somewhat resembles *P. hiera*, but is not that species, was common and in good condition; *Nomiades semiargus* was fine and typical; *Brenthis ino* was found at rest not infrequently on the raspberry bushes; *Pararge egeria* var. *egerides* flew here and there, but was going over; *Brenthis selene* was still in good order; *B. euphrosyne* plentiful but *passé*.

On July 4th I paid a visit to Count Teleki, who has a residence at Tatra Fured, and who is interested in entomology and Nature study generally. I was very kindly welcomed and hospitably treated by the Count, who knows the district thoroughly, and whom I have to thank for much useful information as to localities and species. On this day not much collecting was done, but Count Teleki proposed that we should take our nets and work a small swamp in the neighbourhood of his house for *Cænonympha hero* until lunch was ready; only one or two of this species was met with, but I was delighted to find here the fine form of *Brenthis pales* var. *arsilache*, which was abundant and in fine order.

I was anxious to try the chalk range at the eastern end of the Tatra, where I had been informed that, amongst other species, the much-wanted *Cænonympha leander* was to be found; accordingly on the evening of this day I took a carriage and moved on to Tatra Hohlenhaim or, as it is more usually called, Barlangliget, its Hungarian name. This locality, judging from the flora, looks a very good one, given fine weather, but the four days of my stay were almost continuously dull or rainy, and I did not see very much, and very little indeed that was new to me. The only species taken here, not found at Tatra Lomnitz, were *Lycæna arion*, a small but bright blue form, and one or two *Melitæa dictynna*, which were quite typical. The morning of July 9th broke fairly cloudless, and I made an attempt to get at the higher-ground-frequenting species, but by the time I arrived at the upper edge of the forest clouds had gathered, and with the exception of a glint of sunshine for a few minutes, during which I netted two specimens of *Brenthis pales*, collecting was hopeless for the rest of the day. This form of *B. pales* does not appear to correspond with any of the named forms very closely; the upper sides resemble var. *arsilache* in the large blotches, but the specimens are smaller than those of that form taken on the lower ground at Tatra Fured, whilst the under sides are quite distinct and resemble closely the type; I suppose they might most correctly be styled as intermediate between the type and var. *arsilache*.

On July 9th I removed my quarters to Tatra Fured, which is distant from Barlangliget about fifteen miles, and to get to which one has to go through Tatra Lomnitz. The weather during my stay at Tatra Fured was equally bad with that I had experienced elsewhere in the Tatra, and not much could be done. The day after my arrival, although there was some sun in the morning, the signs were ominous, and I could only get a few more *Brenthis pales* var. *arsilache* in the swamp where I had previously found them. Then the rain commenced to descend in torrents, and continued for the rest of the day. Professor Schmidt had told me that there was a good locality for *Parnassius apollo* var. *carpathica* between Tatra Fured and Tatra Lomnitz, about midway between the two places and on the left side of the road travelling from the former to the latter, and there being glimpses of sun on the morning of July 11th I made my way thither. After beating about on some foothills, which approach close to the road, and rise perhaps 300 ft. above it, I kicked up a pair of this magnificent form, one of which I captured; I afterwards saw some half dozen others, of which two were netted. The specimens, which are all males, expand 88 mm. as against 78 mm., which is the average of my Swiss specimens, although they are not quite so large as my largest Albarracin Sierra example, which expands 92 mm. On the same ground I came across *Polyommatus optilete*. On July 12th the weather broke up again, and the outlook was so hopeless that I felt it was no use my staying longer, and accordingly on the following morning I entrained for Vienna on my route to England.

At Tatra Fured I again came across luminous Coleoptera of two forms, one of these was the apterous female of *Phausis splendula* which was abundant, sitting amongst the herbage on the roadsides in the forest; the whole of the abdomen of this sex, which was white in colour, was phosphorescent, and the light resembled that of our glowworm. The other form was the male of the same species, which flew slowly amongst the trees in the forest, the phosphorescent portion, which was only small, being on the under side of the abdomen; the light, which was much less than in the female, was continuous, and as the flight was steady and in a straight line it had the appearance of an electric spark running along a wire.

The species of Rhopalocera observed in the Hohe Tatra, thirty-three in number, were: *Parnassius apollo* var. *carpathica*, *Aporis cratægi*, *Pieris rapæ*, *P. napi*, *Euchloë cardamines*, *Leucophasis sinapis*, *Gonepteryx rhamni*, *Melitæa dictynnoides*, *M. dictynna*, *Brenthis selene*, *B. euphrosyne*, *B. pales* and var. *arsilache*, *B. ino*, *Argynnis aglaia*, *Aglaïs urticæ*, *Evanessa antiopa* (hybernated), *Pyrameis atalanta*, *Polygonia c-album*, *Erebia medusa* var. *hippomedusa*, *E. ligea* var. *adyte*, *Enodia hyperanthus*, *Pararge mœra*,

P. egeria var. *egerides*, *Cænonympha hero*, *C. iphis*, *Chrysophanus hippothoë*, *Lycæna arion*, *Cupido minima*, *Nomiades semiargus*, *Polyommatus optilete*, *Rusticus argus* (*ægon*), *Nisoniades tages*, *Pamphila sylvanus*, and *Carterocephalus palæmon*.

The number of species of *Rhopalocera* observed in the Budapest district was sixty, and at Herculesbad seventy-six; the total observed in the various districts in Hungary, in which I collected, was one hundred.

Youlgreave, South Croydon: Sept. 5th, 1909.

A NEW BEE OF THE GENUS *HABROPODA* FROM ASSAM.

By T. D. A. COCKERELL.

WHEN collecting in Assam in September 1903, Mr. Rowland E. Turner obtained a very fine species of the genus *Habropoda*, which was recognized by the late Colonel Bingham as undescribed. The type, herewith described, will be placed in the collection of the British Museum.

Habropoda turneri, n. sp.

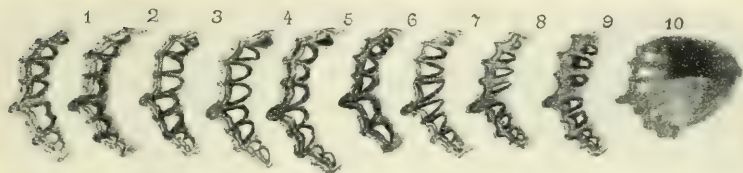
♀. Length about 17 mm., anterior wing 11; robust, but with the abdomen much longer in proportion to its breadth than in *H. zonatula*, Sm.; black, with the pubescence of the head, and thorax above as far back as the level of the hind wings, black; posterior to this, beginning abruptly, the pubescence is sulphur-yellow, and the same, very dense, covers the first two segments of the abdomen; the third segment has the hair short, dense and coal-black; the fourth and fifth have it reddish, more or less black at sides; there is a little pale tomentum at sides of face, and the lower part of the cheeks is covered with long white hair; a peculiar feature is a small patch of appressed white hair just above (a little mesad of) each antenna, surrounded on all sides by erect long black hair; the pleura is covered with long white hair; hair of legs mainly black, but some long white hair on anterior femora beneath; brush at end of hind basitarsus orange-fulvous. Clypeus prominently densely punctured, but the punctures irregular and largely in grooves; antennæ black, third joint a little longer than 4 + 5; tegulæ black; wings fuliginous, third s. m. broader than second; marginal cell long; hind tibiæ broad and flat, not produced at end, the scopæ coarse and dense.

Hab. Shillong, Assam.

A very distinct species, not closely resembling any of the four (*H. montana*, Rad., *H. magretti*, Bingham, *H. moelleri*, Bingham, *H. fulvipes*, Cam.) known from India. There is a certain general resemblance to *H. tarsata*, but that has the hair of the thorax entirely orange-fulvous above.

VARIATION IN *VANESSA URTICÆ*, L.: SEASONAL (CLIMATICAL) AND LOCAL VARIATION IN *V. URTICÆ* AND IN *V. IO*, L., BY WHICH THE TWO SPECIES SHOW A TENDENCY TO MEET IN FACIES.

By T. REUSS.



Variation in *Vanessa urticæ*, L.

THE above figures represent the marginal markings on the hind wings of nine varieties—figs. 1–9—of *V. urticæ*, L., which I reared this season from wild Hertfordshire larvæ. Fig. 10 is the hind wing of an aberration I bred on the 14th of August, 1906, from wild Continental larvæ, and figured as ab. *ioprotoformis* in the Ent. Rec. pl. vii. fig. 5, last April, without at the time describing the specimen.

All the marginal markings depicted are those of female imagines, with two exceptions—figs. 1 and 9. The markings of each specimen in figs. 1–7 were otherwise, as in typical *urticæ*, and the ground colour exhibited its usual variability in different shades of brownish, reddish, and yellowish orange. Figs. 8 and 9 are only slightly aberrant in other details, but in fig. 10 the whole facies is changed.

The width of these marginal markings, as I measured them across the fourth median lunule in different specimens, varied from 2·5 mm. in ab. *pygmæa*, Rühl, measuring 18 mm. along costa of each fore wing, to a little over 4 mm. in a giant form with the fore wings each measuring 28·5 mm. from base to tip. In medium-sized specimens the margin seems to be most often just under 4 mm. broad—almost as broad therefore as in the largest forms.

All the margins here figured vary only very slightly in width, despite the differences not only in the shape and size of the lunules, but also in the size of the whole wings. In fig. 3 the large lunules narrow the outer border (which together with the costal lunules is typical in fig. 1), while in fig. 8 the border is widened and disintegrated, the original brownish suffusion becoming plainly visible, which (also in the other figures) links

up the lunules in a band. In the Corsican variety *ichnusa*, Bon., the brownish suffusion often confines itself to the parts between the fringe and the base of the lunules, leaving the black triangles round the lunules separated towards the apex by the red ground colour. The margin consequently has a very jagged outline. Occasionally it appears also in British specimens. The opposite development is shown in fig. 2 (*parvilunulata*, Rynr.).

Besides appearing in an otherwise typical facies, fig. 2, the margin associated itself with a fine brown ground colour. A specimen of this kind, which I reared in the beginning of last June from larvæ collected full-sized on May 23rd (this is perhaps an early date for full-grown larvæ of *urticæ* in England) exhibited a very dark under side, with the two median puncta of the fore wings each marked by a deep brown blotch, in the same manner as is often exhibited in the under side of another species, *V. xanthomelas*. On the upper side of the fore wings the puncta are large and conspicuous; the inner marginal blotch is, however, obsolete. I suggest for this aberration the name *ab. subtuspuncta* (female).

Fig. 3, for which the varietal name *ab. magnilunulata*, Rynr., appears appropriate, has a yellowish ground colour, and the lunules are sometimes greenish. I reared three specimens of this variety, which were all females, and I am inclined to think that this form with the broad, almost trapeze-shaped blue spots is in truth a "female variety," and perhaps the same may be said of fig. 4.

The ground colour of fig. 4 is brownish with shining light blue lunules. I have also reared this form with violet markings, and sometimes groups of white scales form conspicuous spots among the violet or blue scales of the lunules. In the ocellus of the hind wings in *V. io* occasionally white spots or streaks appear in a somewhat similar manner, and three of these spots are there so placed that they evidently form a continuation of the chain of white spots already present on the fore wings, which sometimes is made complete by an extra spot near the inner angle.

Fig. 5, female, with crescent-shaped lunules is associated with a fiery red or rich orange ground colour, and all the finest specimens I reared were females.

Fig. 6, female, has violet lunules, and only on one hind wing do the anal lunules coalesce as depicted. Fig. 1 shows a transitory form in a male; in transitory females no points protrude from the lunules, but instead they are separated by a narrow black line, the "lean to" of the lunules being quite different. Such transitory females occur sometimes with lunules shaped as in fig. 2.

In other specimens the two largest median lunules tend to coalesce, and on the fore wings, at the apex, broad square blue

spots show a similar tendency. This sort of development—very different from that in *ab. luna* (see *antea*, p. 223, fig. 1), which presents quite another aspect with its *isolated* crescent—points out the possibility that a *continuous blue band* might border the wings. I believe that such a variety (if it does not exist already?) could soon be bred by pairing some of the transitory specimens obtainable from wild larvæ. I would mention here that normal British *V. io*, male and female—as, for instance, they are figured from photographs in Mr. South's 'Butterflies of the British Isles'—have a black-blue spotted margin at the apex of the fore wings, as in *urticæ*, but that a variety may sometimes be captured in which these blue spots spread and form an *unbroken blue band* with black outer border (see figures of *V. io*, 2 and 3).



Climatical (Seasonal) and Local Variation in *Vanessa io*, L., and what it tends to.

Cold induces an urticæ-form facies; heat and contrasts in temperature (cold nights and hot days, cold winters and hot summers), on the other hand, bring *ocelliformity* near perfection, and *efface all resemblance to urticæ*.

Fig. 2, induced by comparatively cool seasons, is the normal form of *V. io* in the British Isles. Fig. 3, induced by hot seasons, occurs with many transitions to Fig. 2 as a variety in Britain, but is, on the Continent, the most common form in many localities, especially in the South, where *V. io* is often double-brooded, and is therefore often figured as typical in Continental butterfly books. Fig. 1 is *V. io ab. fischeri*, Stdfss., induced by cold (temperature experiment representing *exaggerated seasonal influence*); it exhibits the ocellus disintegrated into its constituent parts, with a complete chain of marginal lunules as in var. *ichnusa*, the local heat form of *V. urticæ*. This form, obtained under such conditions, is, however, only an *exaggerated form of Fig. 2*, which latter often exhibits traces of the median marginal lunules, and is a common form in the field wherever the summers are cool and the climate generally contrastless. Fig. 3, with the perfect banded ocellus (as in the peacock's feather) on the fore wings, seems to represent the culminating point of *ocelliform* development in *V. io*; also the hind wings show a fine blue ocellus. But this latter ocellus seems still capable of an exaggerated development, as shown in Fig. 4, induced by exposure of the pupæ to tropical warmth for three days, in which the remaining black bar is suffused with blue. This ocellus contains three small white spots, correlated, evidently, with those of the fore wings. For the latter unusual and beautiful variety (Fig. 4) I suggest the varietal name *ab. splendens*. Figs. 2, 3, and 4 were bred by me from wild Hertfordshire larvæ last July and August. Fig. 1 was bred by Prof. Standfuss by exposing the pupæ to a low temperature (*cf.* Standfuss, 'Handbook of Palearctic Lepidoptera,' 1896). The very large local (heat) form of Sardinia, *V. io ab. sardoa*, Stand., exhibits *variation of the ground colour* instead of the ocelli.

The ocelli appear to be intermediate between figs. 2 and 3, the light ring round the ocellus of the hind wings darkens almost to the colour of the border (exactly as in most heat-forms bred by experiment from northern pupæ), and the dark-coloured fore wings are suffused with fulvous. Northern pupæ of *V. io*, bred in a high temperature, occasionally produce specimens even darker than ab. *sardoa*, and sometimes the ground colour is suffused with brown.

This variety exhibits a much more "peacock-like" ocellus than the normal fly, and to breed it, almost to the exclusion of the type, I found it usually only necessary to keep the larvæ and pupæ in a sunny, warm room, in which the windows must be kept shut against cold during the nights. On the other hand, *not one specimen* of this perfect form emerged from pupæ which I kept in a dark, sunless, comparatively cold place, though it appeared from other pupæ which I subjected to -3° C. three times during the first days of their development. "Contrasts in temperature" here take effect. In this connection I would suggest that almost all kinds of "indoor conditions," even if not purposely modified, differ so essentially from "wild" conditions, that their influence may be considered sufficiently abnormal to help in accounting for the fact that apparently the imagines reared in captivity are oftener given to variation than in open nature.

Fig. 7, female, has violet lunules curved and pointed like teeth, but I have also reared specimens with blue and whitish "teeth." These imagines were of both sexes, and several other forms intermediate between figs. 7 and 8 were all males with only one exception. It seems that very large lunules appear much more easily in the female than in the male, especially on the hind wings; but generally the extent of variation in the size, shape, and position of the lunules is in both sexes as remarkable as is also the variation in the colour of these markings. Grey, yellow, metallic white, green-blue, blue or violet in many shades—all these tints have appeared in the margin of *urticæ*, and, apparently, quite independent of other facial development. Sometimes, also, the lunules are wholly black, while another time they disappear altogether, and the whole hind wing is then fuscous, as in ab. *nigra*, Tutt, ab. *atrebatensis*, Boisd. Occasionally the lunules of the fore wings differ in colour from those of the hind wings *in the same specimen*. This is the case, for instance, in ab. *ioprotoformis*, fig. 10, the lunules of the hind wings being blue, those of the fore wings yellowish white.

Together with the lunules the outer borders of the wings also vary considerably.

Thus in fig. 7 the costal lunules are not separated by the usual fine black line from the outer brown border, which here tends to disappear, while in figs. 8 and 9 it is revealed as part of the brownish band in which the separate lunules "float."

The orange, yellowish, or whitish suffusion at the base of the lunules, which is often brilliant in the type, disappears in these specimens altogether, the borders then reminding somewhat of the wing-borders in *V. io*.

(To be continued.)

SOME EUROPEAN FOSSIL BEES.

By T. D. A. COCKERELL.

WHEN recently in Zürich I took the opportunity to make a critical examination of a number of fossil bees described by Heer from the Miocene of Eningen.* For every facility in this work I am indebted to the kindness of Professor Albert Heim, in whose custody the collections are. The splendid collection of fossil insects at the Zürich Polytechnicum would afford opportunity for many months of fruitful study, and it is much to be regretted that it has been, and is so greatly, neglected by entomologists.

Lithurgus adamiticus (Heer).

Apis adamitica, Heer, Foss. Hym. aus Eningen und Radoboj, p. 4, taf. III. fig. 11. Urwelt der Schweiz, f. 287.

This was described, and has since been cited by authors, as a veritable *Apis*, closely related to the living honey-bee. An examination of the type shows that the resemblance to *Apis* is merely superficial, and, so far as can be seen, the insect essentially agrees with *Lithurgus*. The shape of the abdomen accords well with female *Lithurgus*: the abdomen is a little over 8 mm. long, 4 broad, truncate basally, pointed apically, as preserved warm red-brown with the first three sutures colourless; Heer's figure of the first segment shows the *Lithurgus*-like form. The thorax is short, of the same colour as the abdomen; the legs are not visible. The wings seem short for the size of the insect; the venation is only partly preserved. Marginal cell relatively short, pointed, the end symmetrical, not approaching apex of wing; all this exactly as in *Lithurgus*, and different from *Apis*, or even *Megachile*, the latter having the cell much more obtuse. Stigma slightly developed, as in *Lithurgus*, the part projecting over the marginal cell short, herein like *L. atratiformis*, Ckll.† Basal nervure hardly deflected at the junction of the two sections, and with the upper section relatively long; all this as in *L. atratiformis*, and contrasting with the European *L. fuscipennis*.

* The fossil-beds, cited in all the literature as of Eningen, are actually on the hill above Wangen, and some distance from Eningen. My wife and I visited the place, and collected a series of fossils, but did not obtain any bees.

† Specimens from Tahiti compared.

Basal nervure to base of marginal cell about equal to half length of cell. At first sight one seems to see indications of a third submarginal cell, as figured by Heer, but this is illusory, and is negatived also by the fact that the broad second submarginal receives both the recurrent nervures, the first very near the base, the second some distance from the apex; this differs a little from modern *Lithurgus*, in which the second recurrent is received nearer the apex. The shape of the second submarginal cell also differs from that in living *Lithurgus*, in that it is less constricted above, the second transverso-cubital nervure going more directly to the marginal. Basal nervure meeting the transverso-medial a little on the apical side; it falls distinctly short of it in modern *Lithurgus*.

All things considered, therefore, the (Eningen bee must be placed in *Lithurgus*, with the remark that it is somewhat less modified or specialized in venation than the living species. It might possibly be justifiable to distinguish it sub-generically. In Prussian amber, of Oligocene age, there are two extinct genera of bees possessing only two submarginal cells, and probably referable to a group from which the Megachiloids (including *Lithurgus*) sprung. *Glyptapis mirabilis*, Ckll., has a venation not very unlike that of *Lithurgus adamiticus*, but the stigma is relatively long and narrow. This is, however, a little black bee, slightly over 5 mm. long, with *hairy eyes*, mandibles with a broad cutting edge notched near the apex, metathorax divided by ridges into large subquadrangular areas. The hairy eyes of *Glyptapis* are especially interesting, because this character exists to-day in the parasitic Megachiloid genus *Caelioxys*. (In the African * *C. decipiens*, Spin., the eyes are naked however.) In the other amber genus referred to the eyes are bare. *Ctenoplectrella viridiceps*, Ckll., is a small stout bee like *Glyptapis*, hardly 5 mm. long, claws strongly cleft, pulvillus large, malar space very short, wings dark rufo-fuliginous, stigma large, second submarginal cell receiving first recurrent nervure some distance from base, and second not far from apex. These amber bees, and many others which I have described, are in the museum at Königsberg, where a full account of them is in process of publication. All of the Prussian amber bees, so far as seen by me, are of extinct genera; but the Miocene bees, whether of Europe or America, include various living genera.

Xylocopa abarus (Heer).

The "type" is a bee with a broad thorax; no head or abdomen visible, and the venation cannot be made out. The legs show a scopa, and the hind tibia is very broad, with a gently curved longitudinal ridge visible on both sides, and,

* Specimen from Willowmore, Cape Colony (*Brauns*).

therefore, certainly natural. This ridge is normal for *Xylocopa*, to which the *Bombus abavus*, Heer (*tom. cit.*, p. 5), must apparently be referred. The only doubt arises from Heer's figure, which represents a similar-looking object, but with head and abdomen. The Zürich specimen may therefore not be the true type.

Another *Xylocopa* (*X. senilis*, Heer) has been described from Eningen. The type appears to be at Karlsruhe, and I did not see it.

Xylocopa jurinei (Heer).

Bombus jurinei, Heer, *tom. cit.*, p. 4, taf. III. fig. 8.

The type is a very large and stout-bodied bee, like a *Bombus*. Head lacking, abdomen 12 mm. wide, hind legs with a coarse scopa, marginal cell with a dark cloud. Only part of the venation can be made out, but all that can be seen agrees with *Xylocopa*, and not with *Bombus*. The second recurrent nervure can be seen entering the third submarginal cell far from its end, and the shape of the cell (base and extreme apex not visible) is as in *Xylocopa*. The lower side of the cell is arched before the insertion of the recurrent nervures, as in *X. violacea*. The apical part of the second discoidal cell can also be seen, exactly as in *Xylocopa*. There is also visible a considerable part of the venation of the hind wing, showing the transverso-cubital, and the ends of the marginal and cubital nervures, quite as in *Xylocopa*.

Anthophorites titania (Heer).

Scutellum broad and flat; mesothorax rather small; metathorax with apparently a sharp edge separating base from apical truncation; head absent; first abdominal segment narrowed basally, the abdomen broadest at middle of third segment; stigma narrow, rather well-developed; upper section of basal nervure shorter than lower; marginal cell sharply pointed, rather broad basally; rest of venation cannot be made out.

The specimen here described is supposed to be the type, but it is evidently not the one figured by Heer. The species was described from two specimens from Eningen in the Karlsruhe collection; perhaps the one now at Zürich is one of them. The genus *Anthophorites* cannot be precisely defined, but includes various fossil bees supposed to be more or less similar to *Anthophora*. I herewith designate Heer's first species, *A. mellona*, as the type.

The generic position of *A. titania*, at least as exemplified by the Zürich specimen, remains obscure.

Anthophorites longava, Heer.

♀. Clearly a bee; eyes large; face narrow; middle joints of the rather stout flagellum a little longer than broad; abdo-

men with fine hair, and broad at base, not at all like the specimen of *A. titania*; hind tibia $3\frac{3}{4}$ mm., hind basitarsus about $2\frac{1}{2}$ mm.; hind basitarsus broadened; venation cannot be made out. The generic position of this specimen must remain wholly obscure.

A. longæva was based on two specimens, which, judging from Heer's figures, are probably not even congeneric. The specimen above described is from Eningen, but Heer's first one, from Radoboj, must be considered the true type.

“*Osmia*.”

In 1849 Heer published *Osmia antiqua* from Eningen. This was a poorly preserved insect, which cannot apparently be referred to *Osmia* or any other genus with certainty. In Heer's work, translated and edited by Heywood, 'The Primæval World of Switzerland' (1876), vol. ii. p. 43, I find a statement that there were three species of *Osmia* at Eningen. In the collection at Zürich I find three species from that locality, bearing manuscript names by Heer. One of these, an insect about $9\frac{1}{2}$ mm. long, the abdomen almost 6 mm., shows no venation, and is worthless for descriptive purposes. One is a wasp. The third may be described as follows:—

Andrena (?) *primæva*, n. sp. ♀.

Osmia primæva, Heer, MS. A medium-sized species, with broad subglobose abdomen, clearly a bee. Thorax small; hind legs preserved, showing scopa; three submarginal cells.

The hind legs are robust, formed as in *Andrena*, except that the broad hind femur is swollen above at base; this condition is, however, distinctly approached in some species of *Andrena*. The tibia and broad basitarsus, the latter showing much long hair along its hind margin, are exactly as in *Andrena*. The middle basitarsus is a little longer than the small tibia, and is quite broad, narrowing somewhat toward the base. The form of this basitarsus is rather unusual, but finds a close parallel in *A. hattorfiana* (Fabr.).

The venation, so far as visible, is as follows: stigma long and well-developed, quite normal for *Andrena*; marginal cell quite normal, the apex narrowly rounded, just away from costa, as in *A. morio*; second submarginal cell approximately square, receiving the first recurrent nervure about the middle, as in *A. errans*; third submarginal cell fully twice length of second, but about equally broad on marginal, receiving the second recurrent nervure just before the beginning of the last third; third transverso-cubital with a single curve, not at all angulate; second recurrent nervure normal in form.

The relatively long third submarginal cell suggests *Nomia*, but occurs also in *Andrena*, e. g. *A. albicans*. In the hind wing the marginal, cubital, and transverso-cubital nervures are visible, entirely as in *Andrena*. The transverso-cubital is a little oblique, the lower end most basad.

All things considered, the reference to *Andrena* seems reasonably assured.

Hab.—Miocene rocks at Eningen (*i. e.* Wangen), Baden.

Apis mellifera (L.).

In the Museum of Cambridge University is a piece of amber from the coast off Yarmouth, containing two specimens of genuine *Apis mellifera*, side by side. As preserved, the eyes and ocelli are a fine crimson, evidently from the eye-pigment, and the face and front are a deep metallic reddish, perhaps from a suffusion of the same substance. The basal nervure can be seen falling far short of the transverso-medial, and the other characters of the venation, legs, &c., agree with the honey-bee. The amber, as the museum records show, was purchased in the rough by Benjamin Burwood from fishermen in or near Great Yarmouth. The bees, and other amber insects from the same source, were crudely figured by A. S. Foord in *Trans. Norf. and Norw. Nat. Soc.* vol. v. pt. 1 (1890). The other specimens, also now in the Cambridge Museum, include Coleoptera and Diptera, and a cockroach labelled *Blatta orientalis*, but evidently not that species, and apparently not identical with any living British form. It is well preserved, and should be studied by a specialist in these insects.

Conwentz has given a full discussion of English amber in 'Natural Science,' 1896. Its age has not been precisely ascertained, but if the specimen containing honey-bees is authentic, it must be Pliocene at the oldest, and cannot possibly have anything to do with the true Baltic amber of Oligocene age. Conwentz remarks, however, that much of the succinite in shops at Cromer is imported from abroad in order to satisfy the demand of visitors to the seaside, and from the appearance of the piece containing *Apis*, I cannot help suspecting that it is really copal, and not of English origin at all. Some of the pieces containing beetles seem to be genuine, however, and these should be critically examined.

University of Colorado, Boulder:
September 14th, 1909.

NOTES AND OBSERVATIONS.

PUPATION OF XANTHORHOË (MELANIPPE) FLUCTUATA.—It has been stated that the larva of *X. fluctuata* having made its frail, underground cocoon, postpones the pupal change for a rather long time, perhaps even the entire winter. Some larvæ of this species that I reared last September–October, in a glass tumbler with a little earth at the bottom, formed their cocoons in the soil but against the glass. This method of construction enabled me to see the larva in its cell,

the glass, serving as a window, being only slightly obscured by the flimsy silk lining spun over it. In the three cases where direct observation was possible, the pupa was formed in six to seven days after the larva had fashioned its habitation.—RICHARD SOUTH.

A. PAPHIA var. VALESINA.—Of seventy-seven specimens of *Argynnis paphia* bred this year from ova obtained from a New Forest specimen of *valesina* (male unknown), forty-one emerged type males, twenty-three type females, thirteen var. *valesina*. Unfortunately I was unsuccessful in obtaining a pairing, as it would be interesting to know what percentage of *valesina* would be produced when the male was bred from a *valesina* parent.—E. C. JOY: 2, St, Kilda's Road, Stoke Newington, London, W.

ABERRATION OF ARCTIA CAIA.—A striking aberration of *Arctia caia* was bred from a larva (found by her near her house) by Mrs. Gilbert Humphry, of West Wittering, near Chichester, in July last. The specimen is asymmetrical. The right fore wing is almost entirely brown, whilst the left has the markings clearly indicated. The hind wings are of a unicolorous dark shade, though the dark spots are visible. The moth much resembles the specimen (No. 3) figured in Newman's 'History of British Moths.'—JOSEPH ANDERSON; Chichester.

ACIDALIA DEGENERARIA.—In connection with the note on this moth ('Entomologist,' *antea*, p. 280), perhaps the following remarks on its occurrence in the Isle of Portland many years ago may be of interest:—"1854, from July 2nd to the 11th twenty-four specimens were taken by myself and thirty-five by the late Mr. Frederick Bond. By the 11th of July they had become worn and shabby. In the following year, 1855, from July 3rd to 25th, one hundred and forty-four were taken by myself, and thirty-six by my cousin (the late Rev. H. Adair Pickard). By the 11th of July, in this year, the moth had, as in the previous year, become worn and shabby, but suddenly, just after that date, an entirely fresh brood appeared to have come out, and the greater number of the hundred and forty-four I obtained were from that time to July 25th, when the specimens were still in fair condition. I noticed particularly that the purplish bands in this second brood were, as a rule, of a more dull and dusky hue than in the first; though in the first brood the brightest coloured and largest specimens occurred."—O. PICKARD-CAMBRIDGE; Bloxworth Rectory, November 17th, 1909.

THE CLARK COLLECTION.—The first portion of the collection of British Lepidoptera formed by the late Mr. J. A. Clark was dispersed at auction at Stevens's Rooms on Tuesday and Wednesday, November 2nd and 3rd. The specimens were, as a rule, in good condition, but, except in the case of good varieties or rare species, generally without *data*. Competition for the better lots was keen, several of those present at the sale evidently being bent upon securing some of the more unusual forms, in which the collection was particularly rich, with the result that the two days' sale realized a total of approximately four hundred pounds. Among the more important lots,

"a magnificent rayed variety" of *Pyrameis cardui*, "figured in the 'Entomologist,' vol. xiii. p. 73," sold for £12 12s., and "a remarkable variety" of the same species, also "figured in the 'Entomologist,' vol. vi. p. 345," brought £10 10s. Of *Argynnis aglaia*, a variety "with large black blotches" realized £5 5s., and "a silvery variety figured in South's 'Butterflies,' pl. 61, fig. 3," £7 10s.; while for "a very beautiful variety" of *Melitæa aurinia*, also figured in South's 'Butterflies,' pl. 56, fig. 6, £6 was obtained. Two good blotched forms of *Vanessa urticæ* brought £1 5s. and £1 15s. respectively; an exceptionally dark *Pieris napi* from Co. Londonderry, with others, £1 12s. 6d.; and a fine black variety of *Limenitis sibylla* a like amount. Four good forms of *Chrysophanus phlæas* sold as follows, viz. one almost unicolorous dark brown for £1 4s., one with the row of spots in fore wings joining the margin, making a black border, £5 10s., a pale straw-coloured variety £1 12s. 6d., and one of a pale golden colour 18s.; and a "leaden" coloured specimen of *Lycæna adonis* reached £4 6s. before the hammer fell. The "hermaphrodite" butterflies included a fine and perfect *Argynnis paphia*, which sold at £2 4s.; *Lycæna ægon*, with others, at £1 1s.; two rather worn *L. icarus* at 13s. and 11s. respectively; and a small but fine *Cyaniris argiolus* at £5.

Among the varieties of moths the highest price obtained was £15 for a fine female specimen of *Saturnia carпинi* of a uniform brownish black colour, with the ocelli showing still darker, which was taken by the late Mr. J. A. Clark at Tunbridge Wells on June 3rd, 1878. A black *Dicranura vinula* bred from a larva found on Hackney Marshes realized £7 15s.; a nice light *Asphalia ridens*, £1; and an I V I female of *Setina irrorella* brought the same figure. There were a large number of *Arctia caia*, one of which having the fore wings almost entirely brown, and the hind wings with broadly confluent black markings, sold for £9, and another somewhat similar for £8 8s., while others also put up singly or grouped with one or two specimens of lesser note fetched £6, £5 10s., £3 10s., £3 7s. 6d., £3, and so on down to a few shillings a lot; and a nice light variety of *A. villica* was knocked down at £2 5s. A specimen of *Rumia cratægata*, with markings entirely absent, made £1 1s., and one of a uniform pale brown 15s.; a very pretty variety of *Venilia maculata*, with two large dark blotches in each fore wing, £4 4s., and another almost entirely dark brown dusted with yellow, £4. Among the rare and extinct species, *Chrysophanus dispar* brought £7 10s. for a large richly coloured male, and £6 10s. for a fine large female, while other specimens in good order ranged from £4 4s. to £3. *Lycæna acis* went for from 6s. to 14s. a pair, the higher price named being for a lot in which the female was said to have been taken at Deal in 1879. *Lælia cænosa*, in good condition, realized from £1 1s. to £1 15s. a pair; *Gastropacha illicifolia*, 7s. to £1 each, and one "bred 21st May, 1889, from larva found at Church Stretton by F. B. Newnham," £1 4s. A pair of *Crymodes exulis*, "Loch Laggan, N. Cook," sold for £2, and two lots of three each of the Shetland form for £1 8s. and £2 2s. per lot; while *Noctua subrosea* varied from £2 15s. for a fine female to 10s. 6d. for a pair in less perfect condition. Two specimens of

Orrhodia erythrocephala, "captured by J. H. A. Jenner, Lewes," brought £2 5s. the lot; and four specimens of *Xylina zinckenii* from 18s. to £1 4s. each. Ten specimens of *Cleora viduaria* put up singly realized from 10s. to £1 10s. each, with an average price of just over 16s. 6d., and three fine examples of *Boletobia fuliginaria* captured by the late Mr. J. A. Clark, two in Lower East Smithfield, and one in St. Katherine's Docks, just £2 2s. each after a keen competition.—R. A.

THE BARKER COLLECTION.—Yet another collection of British Lepidoptera, but of smaller size, has come under the hammer, that formed by the late Mr. H. W. Barker being disposed of at Stevens's Auction Rooms on November 16th. There were few really interesting lots, but among the more noteworthy a fine *Lycæna adonis* female, with splashes of male colour in left fore wing, brought £3 15s.; a male *L. corydon*, under side very near var. *obsoleta*, with a nice blue shot female, £1 the pair; a fine male *Nemeophila russula*, with hind wing much suffused with black, and another with quite clear hind wings, £2 15s. the two; a couple of confluent-spotted *Arctia villica*, with two fairly darkly-marked *A. caia*, £1 2s. the lot; and a fine series of thirteen *Cymatophora fluctuosa* £112s. 6d.—R. A.

WANTED.—For breeding experiments in Heredity and Sex-determination, pupæ of *S. mendica* and its (Irish) var. *rustica*.—L. DONCASTER; Zoological Laboratory, University, Birmingham.

CAPTURES AND FIELD REPORTS.

ABUNDANCE OF *PIERIS BRASSICÆ*.—Following on Mr. Joseph Anderson's note on this species (*antea*, p. 282), it may be of interest to mention that *Pieris brassicæ* began to be seen in goodly numbers about the gardens in Eastbourne and on the railway-banks on the way to London about Aug. 12th, and from that time it became more and more common until about the 22nd of that month, when it was met with in unusual abundance not only in the town, but on any sheltered parts of the downs where there were any flowers to attract it. It then gradually diminished in numbers until, by the beginning of October, only an occasional specimen was to be seen. I did not observe any concerted movement on the part of the butterflies, nor was it a case of the sudden appearance of large numbers as has been observed under the influence of migration, but just a gradually increasing number of individuals quite compatible with the natural development of unusually large broods. By the end of September full-fed larvæ also were frequently seen wandering in search of suitable places for pupation, and not a few found their way in at the windows of the house where I was staying, although there was no adjacent cabbage-garden, and spun up on the walls and ceilings of the rooms; and little bunches of yellow ichneumon cocoons, as well as healthy pupæ, were not infrequently seen under the copings of walls in the neighbourhood.—ROBERT ADKIN; Lewisham, November, 1909.

OCNERIA DISPAR AT EASTBOURNE.—On the evening of August 30th last, on my way home from the train, I captured a female *Ocneria dispar* from the trunk of an elm-tree, where it was resting in an apparently torpid condition. It is an unusually large specimen, measuring 74 mm. from tip to tip of the wings, and is somewhat greyer in colour than usual, possibly owing to the loss of wing-scales, although the fringes are in fairly perfect condition. The situation where it was taken is an unlikely one for the species to have bred wild in the immediate neighbourhood, nor has the specimen the appearance of one that had been reared in captivity; there should, however, be no difficulty in this latter point being set at rest.—ROBERT ADKIN.

COLIAS EDUSA AT EASTBOURNE.—Although frequently over the most likely spots in the neighbourhood of Eastbourne during the months of August and September last, the only example of *Colias edusa* that came under my notice was a travel-stained male captured by a friend on the morning of September 17th. The species cannot have been common in Britain during the past autumn, but probably some few specimens may have been noted, and it would be interesting if all such cases were put on record, with particulars of date when met with, and sex and condition of the specimens where known.—ROBERT ADKIN.

STAUROPUS FAGI.—As the “lobster moth” seems to be still of unfrequent occurrence, it is perhaps worth while to record a male taken by myself early in June last; it was on a pane of my study window, and perfectly quiet. In my present crippled condition I had some difficulty in securing it, but first and last it never moved, and had apparently never flown; no bred specimen could be in finer condition. The only perfect insect of this species I have ever before taken here was a female, on the trunk of an oak many years ago; though from the year 1852 at various considerable intervals of time up to now I have met with the larva, but never succeeded in getting a perfect insect; the result having always been that the larva either died after changing to a chrysalis, or else produced an “ichneumon.”—O. PICKARD-CAMBRIDGE; Bloxworth Rectory, November 17th, 1909.

ABUNDANCE OF THE LARVÆ OF PIERIS BRASSICÆ.—With reference to Mr. Joseph Anderson’s note (*antea*, p. 282) on the extraordinary abundance of the larvæ of *P. brassicæ* in the neighbourhood of Chichester, I should like to record their equal abundance in this district, for most of the plants of broccoli, Brussels sprouts, savoys, &c., in the gardens about here present the same melancholy spectacle of bare stalks, and the palings and walls adjacent are covered with their chrysalids, and the yellow nests of cocoons of *Apanteles glomeratus*; and there are still quantities of larvæ to be seen on the plants, or crawling about the walls looking for sheltered corners wherein to pupate, notwithstanding the severe frosts, snow, and hail we have experienced during the last week. I did not notice that the perfect insects were in any way more numerous than usual at the end of

July or in August.—GERVASE F. MATHEW; Dovercourt, Essex, November 17th, 1909.

SCARCITY OF VANESSIDS.—One of the peculiarities of the past remarkable season has been the dearth of the Vanessids. Hybernated specimens of *io* were tolerably plentiful in the spring, and a fair number of fresh examples appeared in August, but of the other species I have not seen more than half a dozen *atalanta*, and about a dozen *urtice*, either in this district or in the neighbourhood of Instow, North Devon, where I spent the latter part of June and most of July. *Cardui* or *polychloros* I never saw at all, nor did I observe any nests of larvæ of either *io* or *urtice*.—GERVASE F. MATHEW.

NOTE ON VANESSA IO.—With reference to Mr. F. W. Frohawk's note (*antea*, p. 260), the recent abundance of *Vanessa io*, to which he calls attention, must have been partial and not general throughout the country. In this neighbourhood the insect has, in my experience, been no commoner than usual this season, in explanation of which statement it may be added that I rarely, if ever, set eyes on half a dozen specimens, and sometimes see none at all, in the course of a single year!—EUSTACE R. BANKES; Norden, Corfe Castle, November 17th, 1909.

SIREX NOCTILIO AND S. GIGAS AT CHICHESTER.—A female *Sirex noctilio* was taken in the kitchen of the Rev. R. Codrington, The Close, Chichester, on September 14th of this year, where its intrusion created some dismay amongst the domestics. The treatment to which it was subjected in consequence had not improved its condition when it reached my hands. On the 26th of the same month a *Sirex gigas* was captured in the neighbourhood.—JOSEPH ANDERSON.

CHARÆAS GRAMINIS IN S. WALES, 1909.—There has been a plague of *graminis* larvæ on the hill pastures of this district this year. At the end of May and the early part of June the nearly full-grown larvæ were crawling over the ground in thousands, and several farmers complained to me of the damage they were doing to the pastures. About the middle of July I found great flocks of crows and other birds were frequenting the hills, attracted by the abundance of pupæ and full-fed larvæ. The grass and other plants were pulled up by the birds in their search, and after observing their *modus operandi* I entered into competition with them, and in less than two hours had obtained on a small area of ground over three hundred pupæ. On pulling up a tuft of withered grass which showed signs of having harboured the larvæ, I sometimes shook out as many as six, eight, or ten pupæ at a time. When the date came for the moths to emerge I found many had been ichneumonated, but I obtained a very nice lot of insects. I understand that some parts of Glamorgan had a similar visitation in 1884.—G. FLEMING; 9, Fairview Terrace, Merthyr Tydfil, October 5th, 1909.

LEUCANIA L-ALBUM AT EASTBOURNE.—On October 14th I took a female example of the above-named species at ivy, which has since laid a few ova. I have worked the same locality every suitable

evening since, with no further success.—EDWIN P. SHARP; 1, Bedford Well Road, Eastbourne, October 26th, 1909.

L. FAVICOLOR IN SUSSEX.—During the summer of 1908 I took a specimen of this insect in East Sussex (exact locality suppressed for obvious reasons). It was not till a recent meeting of the South London Entomological Society that the specimen was identified as the species named, although I personally had no doubt of its identity. The specimen (almost var. *lutea*) is now in the collection of Mr. A. E. Gibbs, St. Albans, who kindly got it identified for me.—W. JARVIS; 73, Murchison Road, Leyton, N.E., October 26th, 1909.

NOTE ON THE PUPE OF NONAGRIA GEMINIPUNCTA.—I notice (*antea*, p. 260) that Mr. Vinall mentions finding nine pupæ of *N. geminipuncta* in one reed. It may be interesting to note that, in Kent, I once found five pupæ between two nodes of one reed-stem.—H. M. EDELSTEN; Forty Hill, Enfield, Middlesex, October 26th, 1909.

LARVÆ OF HADENA PISI ON BOG-MYRTLE.—Referring to Prof. Meldola's note (*antea*, p. 284), I may say that the larvæ of this species are also common on bog-myrtle in the New Forest, especially on the open bogs near the railway line at Holmsley, and I have also found them in the vicinity on bracken occasionally. The species occurs in this district, and I found one larva feeding on gooseberry leaves in my garden, but it does not appear to be common hereabouts.—C. NICHOLSON; 35, The Avenue, Hale End, Chingford.

VANESSA IO AND GONEPTERYX RHAMNI.—Mr. F. W. Frohawk calls attention to the great abundance of the former species in S. E. Essex. I have been astonished at the abundance in this district, as for years I have not seen many. *G. rhamni* has been unusually plentiful here.—E. EVERETT; Letchworth.

ABUNDANCE OF LARVÆ.—Larvæ of *Triphaena pronuba* are in enormous numbers in the garden here this autumn, feeding on almost everything. I have never seen them so abundant. Perhaps other entomologists may have noticed the same thing.—H. M. EDELSTEN.

LYCÆNA CORYDON IN DEVONSHIRE.—With regard to my former note (*antea*, p. 211) on the occurrence of *Lycæna corydon* in Devon, this further information may be of interest. On August 13th last I visited the same spot where I took one male *corydon* last year, and caught three males, though I only stayed about half an hour; all appeared quite fresh. I had no time to search for females, and was unfortunately prevented from paying another visit to the place. However, I think it safe to assume that those three males were not stragglers, but that there is a colony of the species in that locality (which is on the slopes above the sea, about two and a half miles west of Bear Head). I may add that on the bank where I took the specimens referred to, the horseshoe vetch (*H. comosa*), which I believe is one of the food-plants, grows abundantly, and this plant also supports there a flourishing colony of the beautiful *L. adonis*.—F. L. BLATHWAYT; 1, Stonefield Avenue, Lincoln, August 26th, 1909.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 20th, 1909.*—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. Alfred Newstead, of the Grosvenor Museum, Chester, was elected a Fellow of the Society.—The Secretary announced that Mr. G. T. Bethune-Baker and Dr. Malcolm Burr had been elected members of the Council in the place of Mr. G. A. K. Marshall, and Mr. R. Shelford, resigned.—Mr. W. G. Sheldon exhibited series of the butterflies collected by him at Budapest and Herculesbad during the past summer, including *Chrysophanus dispar*, var. *utilus*, *C. alciphron*, *C. thersamon*; *Plebeius argyrognomon*, *Polyommatus orion*, gen. vern. *ornata*; *Melitæa trivia*; *Brenthis hecate*; and *Pyrquus orbifer*.—The Rev. G. Wheeler brought for exhibition series of butterflies taken by him this year in Central Italy. They included a very fine aberration of *Melanargia galatea*, the left upper wings almost entirely black; the right side much coloured; and examples of *Agriades thetis* (*bellarugus*) var. *polonus*, Zll., from Assisi.—Mr. J. W. Tutt gave instances of the occurrence of var. *polonus*, stating that he had himself found it at Cuxton, Kent, where it flew in company with *A. thetis*, and is undoubtedly a hybrid between that species and *A. corydon*, the genitalia being similar, and the food-plants identical.—Mr. G. Talbot showed a remarkable new Lycænid butterfly from the Cameroons—now in the collection of Mr. W. J. Adams—probably constituting a new genus. The neuration most resembles that of the genus *Aslauga*, Kirby, but varies chiefly in the different place of origin of the subcostal nervures of the fore wing, and in the scalloped margin of the hind wing.—Mr. J. W. Tutt exhibited examples of *Spilosoma mendica* bred by Dr. Chapman from the ova found at Hyères, Var., the females mostly normal, but some with a well-defined black border round all the wings.—Mr. W. J. Kaye exhibited series of the two species of *Heliconius*—*H. chesteronii* and *H. weymeri* from Western Colombia. The series of *H. weymeri* included beautiful transitional forms to the aberration *gustavi* in which all trace of the fore wing markings had vanished. He said that probably there was some common influence at work to produce a black fore wing, as this phenomenon was found in several other species of *Heliconius* from Colombia, particularly in the Canea Valley. *Heliconius doris* in both its red and blue hind winged forms produced black fore wing aberrations known as *abtectæ*. *Heliconius ismenius* also occasionally produced much darkened forewings.—Dr. T. A. Chapman gave the results of some temperature experiments made by him upon the larvæ of *Pieris brassicae*. Some at 56° Fahr. took four or five or even more days to pupate. Others at 86° had all pupated in forty-eight hours in each lot so treated. The pupation of a number seemed to be so accelerated that they had not time to make their suspension complete or correctly, and of these not a few did not pupate satisfactorily; the girth catching them in an awkward place, or the larval skin unsuccessfully passing it, &c. After sixteen days there is no sign of any of these making an autumn emergence, though, of the hundreds of ichneumons—*Apanteles glomeratus*—a few dozens came out at the end of eight or nine days from capture of larvæ; or eight from escape of ichneumon larvæ

from caterpillars.—Mr. E. C. Bedwell showed eight examples of *Odontoscelis dorsalis*, Fabr., taken at the roots of *Erodium* on June 21st last, in the neighbourhood of Lowestoft, Suffolk. This is the first record of the species occurring in Britain.—Professor T. Hudson Beare exhibited a specimen of *Cryptamorpha desjardinsi*, Guér., taken by Mr. J. Taylor, of Sandown, I.W., in a bunch of bananas, on August 30th last.—Mr. H. St. J. Donisthorpe exhibited examples of *Chatocnema arida*, Foudras, a species of Coleoptera new to Britain, taken near Ryde, August 26th, 1909; and varieties of *Cassida nobilis* (also exhibited by Mr. J. W. H. Dollman), from St. Helens, I.W., August 1909.—Mr. Donisthorpe also showed two examples of *Formica sanguinea*, Latr., one being half male half hermaphrodite, and the other half male half female, taken in Bewdley Forest in July; and of one example of *Myrmica scabrinodis*, Nyl., half male half hermaphrodite, taken by Mr. Dollman at Ditchling, in September last.—Dr. T. A. Chapman, M.D., F.Z.S., communicated a further series of photographs and “Notes on the Ancillary Appendages of Species of *Plebeius*, to illustrate the Relationships of *Plebeius argus* (*ægon*).”—Mr. R. Shelford, M.A., F.L.S., C.M.Z.S., communicated a paper “On Two Remarkable Forms of Mantid Oothecæ.”—Mr. C. T. Pead communicated “Notes on Some Rare or Little-known South African Homoptera,” with examples of the several species.—Mr. W. F. H. Rosenberg then read a “Note on the Liability of Butterflies to Attacks by Birds and Lizards,” being an account of his observations in Colombia and Ecuador on the subject treated in Mr. G. A. K. Marshall’s paper recently published in the Society’s “Transactions.” Mr. Marshall congratulated Mr. Rosenberg on his extremely interesting remarks, and said that he had been endeavouring to stimulate entomologists in the Tropics to make observations on the behaviour of birds, &c., towards butterflies by sending copies of his paper to them.—The President, Mr. G. C. Champion, Mr. J. W. Tutt, Dr. T. A. Chapman, and other Fellows continued the discussion.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 14th, 1909.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. F. Noad Clark exhibited various species of “ticks” in illustration of his paper.—Mr. Moore, exotic species of “ticks.”—Mr. West (Ashtead), a *Vanessa io* with right side wings noticeably smaller than those on the left.—Mr. Tonge, a tuft of the “flowering lichen,” *Usnea barbata*, from the New Forest, and a fine series of *Sesia apiformis*.—Dr. Hodgson, varied series of *Cyclopides palæmon* and *Urbicola comma*.—Mr. Newman, long series of *Aglaia urticae* and *Papilio machaon* showing variation in size and intensity of markings.—Mr. R. Adkin, ova of *Agriades bellargus* in situ on under sides of leaves of *Hippocrepis comosa*, with full notes on the actions of the female in deposition. He also showed young larvæ of *Celastrina argiolus*, and larvæ, pupæ, and cocoons of *Nola albulalis*.—Mr. Tonge, stereographs of the ova of *A. bellargus*.—Mr. West (Greenwich), *Apion curtisii*, *A. tæcicolle*, *A. pomonæ*, and *A. urticarium* from Deal.—Mr. Joy, bred specimens of *Dryas paphia* var. *valesina* bred from a captured female (forty-one typical males, twenty-three typical females,

thirteen var. *valesina*).—Mr. Step, the fungus *Russula adusta*, with its parasite, another fungus, *Nyctalis parasitica*.—Mr. South, for Mr. Baxter, a *Luperina* sp.* from St. Annes-on-Sea, Lancs, and read notes on *L. testacea* and its forms and allies, and also an interesting series of *Peronea variegana* and its named forms.—Mr. H. Moore, a second brood (?) specimen of *Spilosoma lubricepeda* from Deptford, Sept. 18th; and two instances of Müllerian mimicry, *Heliconius telesiphe* and *Colænis telesiphe*, and *Victorina steneles* and *E. dido* from South America.—Mr. Noad Clark read a paper "A Few Stray Notes on Ticks," and showed a large number of very admirable lantern-slides.—H. J. TURNER, *Hon. Report. Sec.*

RECENT LITERATURE.

Noctuelles et Géomètres d'Europe ; Iconographie Complète de toutes les Espèces Européennes. J. CULOT. Part I. Noctuelles. Genève. July, 1909. 3 fr. 75 cent. (each part).

WE have received the first part of this work from M. Culot, and have much pleasure in bringing it to the attention alike of British collectors and of those interested in the more extended fauna of the Continent of Europe. The work owes its inspiration to M. Charles Oberthür, of Rennes, who has already done so much splendid work in figuring the Lepidoptera of the world; and is intended to provide a reliable and accurate guide to all the Heterocera included in the groups under review. As scientific handbooks, there is no doubt that contemporary German works leave much to be desired in the matter of detailed accuracy of the plates. Produced at popular prices, it is inevitable that the figures should be lacking in that refinement and minute fidelity to the model which alone ensure successful identification of the more perplexing and difficult genera. The processes adopted by the publishers allow little scope for the artist: the often subtle superficial differences of allied species are not seldom wholly lost. As M. Oberthür says in his charming preface, the ideal illustrator is the entomologist who is also a highly skilled artist, assisted in the reproduction of his work by the best machinery at the disposal of the printer. M. Culot, whose art is familiar to all Continental entomologists, most happily unites these qualifications, and the two plates before us, plate i. of Noctuas, *Acrionyctas*, &c., and plate i. of Geometers ("Emeralds") are the *dernier cri* of hand-colour engraving. M. Oberthür believes that not a few of his compatriots are deterred from extending their entomological researches into the Heterocera by reason of the difficulties experienced by collectors in getting their captures named and classified. "There is, however," he proceeds to say, "a fortunate country where such complaints have no *raison d'être*, and that is England. Entomology flourishes there; and entomologists are ever growing more active in the field, and more numerous." We have the monographs of Charles Barrett and Mr. J. W. Tutt, he points out, affording abundant material for the student, while many public collections are open to

* Since determined as *L. guenei*, Doubleday (see *antea*, p. 289).—ED.]

students. Yet, though fully appreciating the illustrations of the late Charles Barrett's great work on British Lepidoptera, we are bound to confess that, with the facilities now afforded M. Culot, a very much higher degree of excellence would have been attained, while Mr. Tutt, of course, has barely touched the subject of this monograph, and his later volumes have not the advantage of coloured illustrations. We can, therefore, the more confidently recommend the method adopted by M. Culot, which relies less upon highly technical and meticulous descriptions than colour presentations to record individual characters, and cordially advise those of our readers who are interested in the subject to apply for full and further particulars from the author and illustrator, Villa-les-Iris, Grand Pré, Geneva.

H. R.-B.

Butterflies and Moths of the United Kingdom. By W. EGMONT KIRBY, M.D. Pp. i.-lii. and 2-468. With seventy coloured plates. Medium 8vo. London: George Routledge & Sons, Ltd.

IN these days of general entomological progress, one expects that the latest book on the lepidopterous fauna of a country should, as its *raison d'être*, exhibit either distinctive features in illustration, or some novel method of presenting the subject. The introduction of some coloured figures of larvæ among those of the imagines on the plates, as has been done in the inexpensive volume before us, is certainly a welcome innovation that will appeal to the nature lover for whom, chiefly, the book has been produced.

A specimen, and occasionally a variety, of very nearly every species of moth and butterfly (Macro-Lepidoptera old style) occurring in the United Kingdom may be found on the coloured plates. Some of the "Micros" also are depicted (Plates lxx.-lxx.). It would not perhaps have lessened the practical utility of the book if some at least of the latter had not been given. For example, the figures on plate lxxvi. are all wrongly named in the text, also in the list of plates and in the index. Twenty-seven species are represented on this plate, and the numbering runs from 1 to 18, then 32 to 40. In the list the numbers for this plate run from 1 to 27, and according to it, and to the text, fig. 1 shows *Botys lupulina*, but this species is really fig. 32 on the plate. Figs. 36 and 37 seem to be *B. ruralis* and *B. lancealis* respectively, but text and list indicate figs. 5 and 6 as these species.

Although very many of the plates are distinctly good, others can only be referred to as medium. On the whole, however, the number of figures that are really unsatisfactory is not excessive.

Turning to the text, we are bound to say that we fail to find very little that will be new to the student of British Lepidoptera. The imago and the larva of each species are more or less briefly described, but we think that variation of the imago, especially of polymorphic species, should have been treated more fully. Distribution, too, is of greater importance, even to the tyro, than our author seems to consider it.

We wonder why *Salmacis* and *Artaxerxes* are set down as species distinct from *Polyommatus alexis*, Scop. (*Lycæna astrarche*), whilst *Cidaria immanata* is figured as a form of *C. truncata* and not even mentioned in the text.

The recent addition to the list of British Lepidoptera—*Anthrocera* (*Zygena*) *achilleæ*—is figured and described, but we cannot trace anything concerning *Leucania faricolor*, Barr.; we have also looked in vain for *Acidalia humiliata*. *Catocala electa* was possibly rejected as an alien, but some other species accepted by our author—*Plusia chalcitis*, Esp., for instance—are certainly not native in any part of the United Kingdom.

The book is liberally supplied with indexes, and it has a table showing the Systematic Arrangement of Families and Genera. It is well printed and is altogether an attractive volume.

Cornell University. Department of Entomology. Bull. 265. April 1909. "On Certain Seed-infesting Chalcis-flies." By Cyrus R. Crosby.

TREATS of the Apple-seed Chalcis (*Syntomaspis druparum*), the Sorbus-seed Megastigmus (*Megastigmus brevicaudis*), the Rose-seed Megastigmus (*M. aculeatus*), the Douglas Fir-seed Chalcis (*M. spernotrophus*), the Grape-seed Chalcis (*Eroxysoma vitis*), and two other species, infesting seeds of the Virginia Creeper and seeds of the Sumac respectively. There are a number of excellent figures in the text.

The following have also been received:—

United States Department of Agriculture. Bureau of Entomology:—

Bulletin No. 64, part vi.: "The Greenhouse Thrips." By H. M. Russell. Part vii.: "New Breeding Records of the Coffee-bean Weevil." By E. S. Tucker.

Bulletin No. 66, part iv.: "The Leaf-hoppers of the Sugar Beet." E. D. Ball, Ph.D. Part v.: "The Semitropical Army Worm." By F. H. Chittenden & H. M. Russell. Part vi.: "The Hop Flea-beetle." By F. H. Chittenden, Sc.D.

Bulletin No. 68, Pl. i. (Revised): "The Pear Thrips." By Dudley Moulton. Part ix.: "The Peach-tree Bark-beetle." By H. F. Wilson.

Bulletin No. 75, part vi.: "The Status of Apiculture in the United States." By E. F. Phillips, Ph.D. Part vii.: "Bee Keeping in Massachusetts." By Burton N. Gates.

Bulletin No. 78: "Economic Loss to the People of the United States through Insects that carry Disease." By L. O. Howard.

Bulletin No. 80, part i.: "The Codling Moth in the Ozarks." By E. L. Jenne. Part ii.: "The Cigar Case-bearer." By A. G. Hammar. Part iii.: "Additional Observations on the Lesser Apple Worm." By S. W. Foster & P. R. Jones. Part iv.: "The Pear Thrips and its Control." By Dudley Moulton.

Bulletin No. 82 part i.: "The Colorado Potato Beetle in Virginia in 1908." By C. H. Popenhoe.

Technical Series, No. 12, part vii.: "The Orange Thrips." By Dudley Moulton. Part viii.: "Biological Studies on Three Species of Aphididæ." By John Juan Davis. Part ix.: "A New Genus of Aleyrodidæ." By A. L. Quaintance.

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